



# ACADEMIC PROFORMA

## 2025/2026




**QS** WORLD UNIVERSITY RANKINGS

**WE ARE RANKED #1001-1200**  
(Overall 8,467 Evaluated Institutions)  
Malaysia ranked #28  
QS World University Rankings 2026

## BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS



**QS** WORLD UNIVERSITY RANKINGS

**248**  
Universiti Tun Hussein Onn University of  
Malaysia (UTHM)



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

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 Training  
Universiti Tun Hussein Onn Malaysia  
August 2025

## Contents

Foreword from Vice Chancellor	i
Foreword from Deputy Vice Chancellor (Academic and International)	ii
Foreword from Dean, Faculty of Electrical and Electronic Engineering	iii
Vision of University	iv
Mission of University	iv
Education Philosophy of University	iv
Logo of University	iv
Chancellor	v
Board of Directors of University	viii
Members of Senate	ix
Faculty of Electrical and Electronic Engineering	
Vision, Mission, Direction, Motto, Quality Policy and Quality Objectives	1
Faculty Background	2
Organizational Chart	3
External Visitors	
Adjunct Professor, Visiting Professor, External Examiner and Industrial Advisory Panel	4
Staff Directory	5
Programme Information	22
About the Programme	23
Programme Structure and Assessment	23
Duration and Award	23
Course Outlines	23
Professional Accreditation	23
Career Opportunities	23
Commencement of Study	23
Contact Us	23
Programme Educational Objectives (PEO)	25
Programme Learning Outcomes (PLO)	25
Roadmap – Bachelor of Electrical Engineering with Honours	26
Study Plan	27
Synopsis of University Courses	29
Synopsis of Core Mathematics Courses	34
Synopsis of Core Faculty Courses	36
Synopsis of Core Programme Courses	38
Synopsis of Elective Courses	53
Synopsis of Master Integration Courses	60
Further Education Pathway	62
Disclaimer	64

## Foreword from Vice Chancellor



Assalamualaikum Warahmatullahi Wabarakatuh and greetings.

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

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

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

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

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

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

*“With Wisdom, We Explore”*

Best wishes.

**PROFESSOR DR. MAS FAWZI BIN MOHD ALI**

Vice-Chancellor

Universiti Tun Hussein Onn Malaysia

## Foreword from Deputy Vice Chancellor (Academic and International)



Assalamualaikum Warahmatullahi Wabarakatuh and Salam Sejahtera, Salam Malaysia Madani.

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

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

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

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

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

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

Best wishes,

**PROFESSOR DR. SHAHRUDDIN BIN MAHZAN @ MOHD ZIN**

Deputy Vice Chancellor (Academic and International) Universiti Tun Hussein Onn Malaysia

## Foreword from Dean FKEE



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 Electrical Engineering with Honours (BEV) 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. 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 the 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**

Setiausaha Kerajaan Johor

## **Board of Directors of University**

### **Chairman**

---

**YBhg. Dato' Sri Ibrahim bin Ahmad**

### **Members**

---

**YBhg. Prof. Dr. Mas Fawzi bin Mohd Ali**

Vice-Chancellor, Universiti Tun Hussein Onn Malaysia

**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. Datuk Md Jais bin Haji Sarday**

Board Member, Universiti Tun Hussein Onn Malaysia

**YBrs. Mr. Shahril Anwar bin Mohd Yunos**

Managing Partner, Virtus Capital Partners Sdn Bhd

**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

### **Secretary**

---

**YBrs. Mr. Naim bin Maslan**

Registrar/Chief Operating Officer (COO), Universiti Tun Hussein Onn Malaysia

## **Members of Senate**

---

### **Chairman**

**YB. Prof. Dr. Mas Fawzi bin Mohd Ali**

Vice Chancellor

### **Members**

**Prof. Dr. Shahrudin bin Mahzan @ Mohd Zin**

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. Dr. Afandi bin Ahmad**

Provost UTHM, Pagoh Branch Campus

**Prof. Ir. Dr. Md Saidin Bin Wahab**

Assistant Vice Chancellor / Chief Digital Officer (CDO) (Digital and Infrastructure)

**Prof. Dr. Mohamad Zaky bin Noh**

Dean, Centre for Graduate Studies

**Prof. Ir. Ts. Dr. Mohd Haziman bin Wan Ibrahim**

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

**Assoc. Prof. Dr. Shafie Bin Mohamed Zabri**

Dean, Faculty of Technology Management and Business

**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. ChM. Dr. Hatijah binti Basri**

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

**Dr. Lutfan bin Jaes**

Dean, Centre for General Studies and Co-curricular

**Assoc. Prof. Dr. Hj. Azmi Bin Abdul Latiff**

Dean, Centre for Language Studies

**Prof. Dr. Abd Rahman bin Ahmad**

Dean, Johor Business School

**Assoc. Prof. Dr. Rosli Bin Omar**

Director, Centre for Academic Development and TVET

**Assoc. Prof. Dr. Badaruddin bin Ibrahim**

Director, Malaysia Research Institute for Vocational Education and Training

**Dr. Zahrul Akmal bin Damin**

Institute for Social Transformation and Regional Development (TRANSFORM)

**Prof. Ts. Dr. Mohd Khairul bin Ahmad**

Institute for Integrated Engineering(I<sup>2</sup>E)

**Prof. Ts. Dr. Aeslina Binti Abdul Kadir**

Faculty of Civil Engineering and Built Environment

**Prof. Ts. Dr. Norzila binti Othman**

Faculty of Civil Engineering and Built Environment

**Prof. Ir. Dr. Erwan bin Sulaiman**

Faculty of Electrical and Electronic Engineering

**Prof. Dr. Nafarizal bin Nayan**

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. Sr. Dr. Wan Zahari Wan Yusof**

Faculty of Technology Management and Business

**Prof. Ts. Dr. Alina binti Shamsuddin**

Faculty of Technology Management and Business

**Prof. Ts. Dr. Soew Ta Wee**

Faculty of Technology Management and Business

**Prof. Ts. Dr. Rosziati binti Ibrahim**

Faculty of Computer Science and Information Technology

**Prof. Dr. Rozaida binti Ghazali**

Faculty of Computer Science and Information Technology

**Prof. Ts. Dr. Zaidi bin Embong**  
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

**Ts. Dr. Khalid bin Isa**  
Director, Student Development Centre

**Prof. Dr. Nazri bin Mohd Nawi**  
Director Centre Information Technology

**Prof. Eur Ing. Ir. Ts. Dr. Shahiron bin Sahidan**  
Faculty of Civil Engineering and Built Environment

**Mr. Naim bin Maslan**  
Registrar / Chief Operating Officer (COO) / Secretary of Senate

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

**Mdm. Zaharah binti Abd Samad**  
Chief Librarian

**Mdm. Norliah Binti Yaakub**  
Legal Advisor

**Prof. Ir. Ts. Dr. Mohd Irwan bin Juki**  
Pengerusi Majlis Profesor Universiti

# **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 Technoprenuer 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.

## 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 Electrical Engineering (JKEK)
2. Department of Electronic Engineering (JKEN)
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 role 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. BioMedical Engineering and Measurement System (BioMEMS)
12. VLSI and Embedded System Technology (VEST)
13. Advanced Medical Imaging and Optics (AdMedic)
14. Advanced Sensing Device and Technology (ASDT)
15. Optical Communication and Artificial Intelligence (OCAI)
16. RF and Microwave Devices (RFMD)
17. Wireless and Propagation (WaP)
18. Electroencephalogram and Human Potential (EEG)

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 Electrical Engineering with Honours (BEV)
2. Bachelor of Electronic Engineering with Honours (BEJ)
3. Master in Electrical Engineering (Coursework) (MEE)
4. Master in Electrical Engineering (Research) (KEE)
5. Master of Science Internet of Things (Coursework) (MET)
6. Doctor of Philosophy in Electrical Engineering (PEE)

# ORGANIZATIONAL CHART



## EXTERNAL VISITORS

### External Examiner



**Prof. Ir. Dr. Hazlie bin Mokhlis**  
Universiti Malaysia (UM)

### Industrial Advisory Panel



**Datuk Ir. Mohd Tajudin bin Romli**  
TRMS Engineering Sdn. Bhd.



**Ir. Abd. Karim bin Abd Rahman**  
Petronas Technical Services Sdn. Bhd.

## 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)

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

#### 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. Wan Mahani Hafizah binti Wan Mahmud  
PhD (Biomedical Engineering) (UTM)  
BEng (Biomedical Engineering) (UTM)

#### Laboratory Manager

Dr. Mohamed Najib bin Ribuan  
Phd (Mechatronic) (Okayama University)  
MSc (Mechatronic) (Newcastle University)  
BEng (Electrical-Mechatronic) (UTM)

#### Senior Assistant Registrar

Mdm Nur Faezah binti Mohamed Noor  
BSc (Psychology) UKM

**Assistant Registrar**

Mr. Dzulfitry Ameen Bin Iskandar

**Senior Deputy Administrative**

Mr. Nazri Bin Mohd Suhud

**Deputy Administrative Officer**

Mdm. Nur Farahana bt Azman

**Office Secretary**

Mdm. Norlailah bt Miswan

**Office Secretary**

Mdm. Rusnani binti Saji

**Senior Assistant Administrative Officer**

Mr. Hashim bin Hamdan

**Senior Administrative Assistant**

Mdm. Saemah binti Ariffin

**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 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 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)

#### **Professor Ts. Dr. Asmarashid bin Ponniran**

PhD (Power Electronics) (Nagaoka University of Technology)  
MEng (Electrical Power) (UTM)  
BEng (Electrical) (KUiTTHO)

#### **Associate Professor Ir. 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. 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. 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. Mohd Noor bin Abdullah**

PhD (Electrical Power Engineering) (UM)

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)

**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)

**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)

**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. Nor Hafizah binti Ngajikin**

PhD (Electrical Engineering) (UTM)

MEng (Electrical) (UTM)

BEng (Electrical - Telecommunication) (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 Electronic Engineering (JKEN)

### Head of Department

#### **Dr. Wan Suhaimizan bin Wan Zaki**

PhD (Electrical and Electronic Engineering) (University of Nottingham)

MEng (Electronic Engineering) (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)

#### **Associate Professor Ir. Dr. Fauziahanim binti Che Seman**

PhD (Electrical Engineering) (Queen's University of Belfast)

MEng (Electrical - Communication) (KUiTTTHO)

BEng (Telecommunication) (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) (KUiTTTHO)

BEng (Electronic) (UTM)

#### **Associate Professor Dr. Muhammad Ramlee bin Kamarudin**

PhD (Electrical Engineering) (University of Birmingham)

MEng (Communication Engineering) (University of Birmingham)

BEng (Engineering) (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) (KUiTTTHO)

**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)

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

**Ts. Dr. Jong Siat Ling**  
PhD (Electrical Engineering) (UTM)  
MEng (Electrical - Electronics and Telecommunications) (UTM)  
BEng (Electrical - Telecommunication) (UTHM)

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

**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. Saizalmursidi bin Md Mustam**

PhD (Electrical Engineering) (UTM)  
MEng (Electrical) (UTHM)  
BEng (Electronic-Communication) (KUiTTTHO)

**Dr. Shaharil bin Mohd Shah**

PhD (Electrical & Electronic Engineering) (University of Birmingham)  
MSc (Microwave and Wireless Subsystems Design) (University of Surrey)  
BEng (Electronic) (MMU)

**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) (KUiTTTHO)  
BEng (Electrical) (Univ. of Toledo, Ohio)

**Mdm. Nurulhuda binti Ismail**

MEng (Electrical) (UTHM)  
BEng (Electrical) (UiTM)

**Ts. Sharifah binti Saon**

MEng (Electrical) (KUiTTTHO)  
BSc (Electrical) (KUiTTTHO)

**Specialisation Area: Computer Engineering (BEC)**

**Associate Professor Ir. Dr. Abd Kadir bin Mahamad**

PhD (Electrical Engineering and Computer Science) (Kumamoto University)  
MEng (Electrical) (KUiTTTHO)  
BEng (Computer Technology) (KUiTTTHO)

**Associate Professor Dr. Afandi bin Ahmad**

PhD (Electronics & Computer Engineering) (Brunel University)  
MSc (Microelectronic) (UKM)  
BEng (Electrical) (KUiTTTHO)

**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. Ts. 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) (KUiTTTHO)  
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)

**Dr. Chew Chang Choon**

PhD (Computer Engineering) (Okayama University)  
MEng (Electrical) (KUiTTTHO)  
BEng (Electrical) (UTM)

**Dr. Chua King Lee**

PhD (Electrical Engineering) (UTHM)  
MSc (Microelectronic) (UKM)  
BEng (Electrical) (KUiTTTHO)

**Ts. Dr. Khalid bin Isa**

PhD (Computational Intelligence) (USM)  
MEng (Computer and Communication System) (UPM)  
BSc (Computer Science) (UTM)

**Dr. Mohamad Hairol bin Jabbar**

PhD (Nanoelectronic & Nanotechnology) (Universite de Grenoble)  
MSc (Electrical and Electronic) (Liverpool John Moores University)  
BEng (Electrical) (KUiTTTHO)

**Ts. Dr. Nan bin Mad Sahar**

PhD (Electrical Engineering) (Okayama University)  
MEng (System & Communication Engineering) (Okayama University)  
BEng (Information & Computer Engineering) (Okayama University)

**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. Shamsul bin Mohamad**

PhD (Computer Science) (UTM)

MSc (Computer Science) (USM)

BSc (Computer Science) (UTM)

**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)

**Mr. Mohd. Helmy bin Abd Wahab**

MSc (Information Technology) (UUM)

BSc (Information Technology) (UUM)

**Mdm. Munirah binti Ab Rahman**

MEng (Electrical - Communication & Computer) (UKM)

BEng (Electrical) (KUiTTHO)

**Mdm. Nor'aisah binti Sudin**

MSc (Intelligent Knowledge Based System) (UUM)

BSc (Computer Science) (USM)

**Mdm. Zarina binti Tukiran**

MEng (Communication & Computer) (UKM)

BSc (Computer Science) (UTM)

**Specialisation Area: Mechatronic and Robotic Engineering (BER)**

**Associate Professor Ts. 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 (Robotic)(University of Bristol)  
MSc (Mechatronic) (UIAM)  
BEng (Electrical and 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)

**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. Hisyam bin Abdul Rahman**

PhD (Electrical Engineering) (UTM)  
BEng (Electrical - Mechatronic) (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 Ts. 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)

**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)

**Dr. Nabihah@Nornabihah binti Ahmad**

PhD (Electronic Engineering) (Massey University)  
MEng (Electrical) (KUiTTTHO)  
BEng (Electrical and Electronic) (UKM)

**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 and Electronic) (UTM)

**Mdm. Rosnah binti Mohd Zain**

MEng (Electrical) (KUiTTTHO)  
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)

**Associate Professor Ir. Dr. Audrey Huong Kah Ching**

PhD (Biomedical Optics and Imaging) (University of Nottingham)  
BEng (Medical Electronic) (KUiTTTHO)

**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 Ir. Dr. Soon Chin Fhong**

PhD (Molecular & Biomedical Engineering) (University of Bradford)  
MEng (Electrical) (ITTHO)  
BEng (Medical Electronics) (ITTHO)

**Associate Professor 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)

**Ir. Dr. Farhanahani binti Mahmud**

PhD Engineering (Biomechanical Science & Bioengineering) (Osaka University)

BEng (Electric & Electronic Engineering) (Toyama University)

**Dr. Ashok Vajravelu**

PhD (Medical Electronic) (Anna University)

MEng (Process Control and Instrumentation) (Annamalai University)

BEng (Electronics and Communication) (Bharathiar University)

**Dr. Ida Laila binti Ahmad**

PhD (Electrical Engineering) (UTM)

MEng (Electrical – Electronic and Telecommunication) (UTM)

BEng (Electronic) (MMU)

**Dr. Mohamad Nazib bin Adon**

PhD (Electrical Engineering) (UTHM)

MEng (Electrical - Electronic and Telecommunication) (UTM)

BEng (Electrical) (UTM)

**Ts. Dr. Muhammad Hazli bin Hj. Mazlan**

PhD (Biomedical Engineering–Biomechanical) (Kyushu University)

MEng (Biomedical) (UM)

BEng (Electrical) (KUiTTHO)

**Dr. Nur Ilyani binti Ramli**

PhD (Electronic Engineering - Medical) (University of Bradford)

BEng (Electrical and Electronic) (Leeds Metropolitan University)

**Dr. Wan Mahani Hafizah binti Wan Mahmud**

PhD (Biomedical Engineering) (UTM)

BEng (Biomedical Engineering) (UTM)

**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 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)

#### **Mr. 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. JB)

#### **Mr. Ayoub bin Kasno**

Cert. (Electronic & Computer Technology) (Poli. Ungku Omar)

#### **Mr. Hairul Nizam bin Tukimin**

Cert. (Electronic Engineering) (Poli. Johor Bahru)

#### **Mr. K. Kovalan A/L Kanawathi**

Dip. (Electronic Engineering) (Poli. KB)  
Cert. (Electrical & Electronic Engineering) (Poli. JB)

#### **Mr. M. Nazeri bin Sarmijan**

Dip. (Electrical Engineering) (Poli. PD)  
Cert. (Electrical Power) (Poli. Sultan Hj. Ahmad Shah)

#### **Mr. Mahmud bin Munajat**

Cert. (Electronic Communication Engineering) (Poli. Johor Bahru)

#### **Mr. Maslan bin Ahmad**

Cert. (Electronic Communication) (Poli. KB)

**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. Mohd Shahidan bin Madiyah**

Cert. (Electronic Engineering (Control)) (Poli. JB)

**Mr. Mohd Shamsuddin bin Muslim**

Cert. (Electrical Power) (Poli. PD)

**Mr. Mohd Zaki bin Zakaria**

Cert. (Electrical & Electronics Engineering) (Poli. JB)

**Mr. Muhammad Haziq Azwan Bin Reduan**

Dip. (Electronics & Communication Engineering) (Poli. Ibrahim Sultan)

**Mdm. Nafizah binti Salleh @ Ali**

Cert. (Electronic & Computer Technology) (Poli. Ungku Omar)

**Mdm. Nooreis Shadila binti Jarkasi**

Dip. (Electronic Engineering (Computer)) (Poli. Seberang Perai)

Cert. (Electrical & Electronics Engineering) (Poli. Johor Bahru)

**Mr. Norazizi bin Hamisan**

Dip. (Electronic Engineering) (Poli. Johor Bahru)

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. JB)

Cert. (Electrical & Electronics Engineering) (Poli. JB)

**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. PD)

**Mr. Syafiq Afiq bin Sulaiman**

Cert. (Electrical Engineering) (Poli. JB)

**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. JB)

**Mdm. Junaidah binti Azlan**

Sijil Pelajaran Malaysia (SPM)

**Mdm. Wasnita binti Hamsan**

Sijil Pelajaran Malaysia (SPM)

## PROGRAMME INFORMATION

### BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS (BEV)

#### About the Programme

Bachelor of Electrical Engineering with Honours (BEV) focuses on students' development in order to produce engineers with attributes outlined by International Engineering Alliance (IEA). The deliveries and assessments are adopting Student-Centered Learning (SCL) approaches, such as Problem-Based Learning (PBL) and Project-Oriented Problem-Based Learning (POPBL). Apart from that, students in BEV programme are also trained to solve complex engineering problems, as well as engaged in complex engineering activities. The graduates of BEV programme are expected to be competent in the field of electrical engineering to fulfill the needs of industries. Upon graduation, BEV graduates will be able to register with Board of Engineers Malaysia (BEM) under 'Electrical' branch. This will entitle them to work as electrical engineers, be it in Malaysia or abroad. After minimum of three (3) years working as engineers, they are able to apply as Professional Engineers through BEM, and their career paths can be further extended to become Competent Engineers and Competent Service Engineers through Energy Commission (EC) Malaysia.

#### 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 Electrical Engineering with Honours

#### Course Outline:

This program consists of the following courses:

##### Year 1 (Semester 1 & 2)

Occupational Safety and Health, Ordinary Differential Equations, Computer Programming, Electric Circuit I, Digital electronics, Analog Electronics, Electric Circuit II.

##### Year 2 (Semester 3 & 4)

Electrical Engineering Laboratory I, Polyphase Circuit, Transform Circuit, Electrical Measurement and Instrumentation, Mechanical Sciences, Multivariable Calculus, Creativity and Innovation, Electrical Engineering Laboratory II, Electrical Machines, Power Generation, Transmission and Distribution, Electromagnetics Fields and Waves, Numerical Method, Engineering Economic & Entrepreneurship.

##### Year 3 (Semester 5 & 6)

Power Engineering Laboratory I, Power Electronics, Electronics Communication Systems, Power System Analysis, Engineering Statistic, Engineering Management, Power Engineering Laboratory II, , Electrical Drives, Digital Signal Processing, Integrated Design Project, Control Systems, Engineer and Society.

### **Year 3 (Short Semester - 10 Weeks)**

Industrial Training

### **Year 4 (Semester 7 & 8)**

Power Engineering Laboratory III, Industrial Power Systems, Utilisation of Electrical Energy, Power System Protection, Final Year Project I, , Elective Courses (I, II & III), Final Year Project II, Power Engineering Laboratory IV, High Voltage Engineering.

### **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**

Electrical Engineer, Protection Engineer, Power Quality Engineer, Renewable Energy Engineer, Power System Engineer, Plant Engineer, Design Engineer, Project Engineer, Production Engineer, Competent Electrical Engineer, Electrical Service Engineer, Project Manager, Electrical Consultant, Energy Manager, Electrical Engineering Lecturer.

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 taught postgraduate programmes (MSc, MEng, MBA, etc.).

### **Commencement of Study**

Twice a year in October and March

### **Contact Us**

Website directory UTHM: <https://uthm.edu.my/>

Website directory FKEE: <https://fkee.uthm.edu.my/>

Regarding Bachelor of Electrical Engineering with Honours Programme (BEV)

Associate Professor Ir. Dr. Norakmal binti Mohd Jamail

☎ +607 - 456 4509

✉ [norakmal@uthm.edu.my](mailto:norakmal@uthm.edu.my)

## BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS (BEV)

### PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

- PEO 1**      Able to build a career and become a leader in engineering fields
- PEO 2**      Recognised as competent engineering professionals in providing technical solutions locally or globally.
- PEO 3**      Contribute to society with consideration for environment and sustainable technology.

### 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 solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, 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	Modern 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**  
**BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS**

**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	
	UQU10902	*Integrity and Anti-Corruption (local)	2	
	UWB11002	**Malay Language (international)	2	
	UQ*1xxx1	Co-Curriculum I	1	
	BEE12202	Occupational Safety and Health	2	
	BEE11203	Ordinary Differential Equations	3	
	BEV10102	Computer Programming	2	
	BEV10303	Electric Circuits I	3	
	<b>Total</b>			<b>15*/15**</b>

\*Local Student, \*\* International Student

Sem	Course Code	Course Name	Credit	
2	UHB13102	English for General Communication	2	
	UQU10702	*Appreciation, Ethnics and Civilization (Local)	2	
	UQI11202	Philosophy and Current Issues	2	
	UQU11802	**Malaysia Studies and Culture (international)	2	
	UQ*1XXX1	Co-Curriculum I	1	
	BEV10403	Electric Circuits II	3	
	BEV10503	Analog Electronics	3	
	BEV10603	Digital Electronics	3	
	<b>Total</b>			<b>16*/16**</b>

\*Local Student, \*\* International Student

**YEAR 2**

Sem	Course Code	Course Name	Credit
3	UHB1XX02	Foreign Language	2
	BEE20303	Multivariable Calculus	3
	BEE22402	Creativity and Innovation	2
	BEV20103	Electrical Measurement and Instrumentation	3
	BEV20203	Transform Circuit	3
	BEV20403	Polyphase Circuit	3
	BEV20501	Electrical Engineering Laboratory I	1
	BEV20602	Mechanical Sciences	2
	<b>Total</b>		

Sem	Course Code	Course Name	Credit	
4	UHB23102	English for Technical Communication	2	
	BEE22503	Engineering Economic and Entrepreneurship	3	
	BEE32402	Numerical Methods	2	
	BEV20303	Electromagnetic Fields and Waves	3	
	BEV20903	Power Generation, Transmission and Distribution	3	
	BEV20803	Electrical Machines	3	
	BEV20901	Electrical Engineering Laboratory II	1	
	<b>Total</b>			<b>17</b>

**YEAR 3**

Sem	Course Code	Course Name	Credit
5	BEE30103	Engineering Management	3
	BEE32502	Engineering Statistics	2
	BEV30103	Electronic Communication Systems	3
	BEV30203	Power Electronics	3
	BEV30903	Power System Analysis	3
	BEV30401	Power Engineering Laboratory I	1
	<b>Total</b>		<b>15</b>

Sem	Course Code	Course Name	Credit
6	UHB33102	English for Professional Communication	2
	BEE32302	Engineers and Society	2
	BEV30503	Control Systems	3
	BEV30603	Digital Signal Processing	3
	BEV30703	Electric Drives	3
	BEE32603	Integrated Design Project	3
	BEV30901	Power Engineering Laboratory II	1
	<b>Total</b>		<b>17</b>

Sem	Course Code	Course Name	Credit
7	BEE32205	Industrial Training	5
	<b>Total</b>		<b>5</b>

#### YEAR 4

Sem	Course Code	Course Name	Credit
8	BEE40602	Final Year Project I	2
	BEV40803	Utilisation of Electrical Energy	3
	XXXxxxx3	Elective I* (Floating/Focus/Master Integration)	3
	BEV40403	High Voltage Engineering	3
	BEV40302	Power Engineering Laboratory III	2
	XXXxxxx3	Elective II* (Focus/Master Integration)	3
	<b>Total</b>		<b>16</b>

Sem	Course Code	Course Name	Credit
9	BEE40704	Final Year Project II	4
	BEV40203	Industrial Power Systems	3
	XXXxxxx3	Elective III* (Floating/Focus/Master Integration)	3
	BEV40702	Power Engineering Laboratory IV	2
	BEV40103	Power System Protection	3
	<b>Total</b>		<b>15</b>

**TOTAL CREDIT 135**

**\*ELECTIVE COURSES/ MASTER INTEGRATION COURSES = 9 CREDITS ( 3 COURSES)**

Elective	Course Code	Course Name	Credit
<b>Focus (Min 2 Max 3)</b>	BEV41003	Railway Power System Engineering	3
	BEV40903	Energy Management and Efficiency	3
	BEV40603	Power Quality	3
	BEV40503	Instrumentation for Process Control	3
	BEE41503	Photovoltaic Systems	3
	BEE41403	Electric Vehicles	3
	BEE41303	HCIA Artificial Intelligence	3
	BEE41203	HCIA Cloud Computing	3
	BEE41103	HCIA Routing and Switching	3
<b>Floating (Max 1)</b>	UQU40103	Professional at Work	3
	EW40203	Data Visualisation	3
	EW40103	Data Science and Applications	3
	EIF40103	Machine Learning	3
	BEE40903	Introduction to Big Data	3
	EE40203	Energy Literacy	3
<b>Master Integration; 3 Courses)</b>	MEE10603	Advanced Power Electronics	3
	MEE10403	Computational Intelligence	3
	MEE10303	Advanced Digital Signal Processing	3
	MEE10203	Programmable Electronic	3
	MEE10103	Advanced Engineering Mathematic	3

## SYNOPSIS OF UNIVERSITY COURSES

### **UHB13102 English for General Communication**

#### *Synopsis:*

This course aims to develop students' existing English Language skills so they will be able to communicate better in their current higher education setting. 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/>
4. Cambridge Assessment English (2025). B1 Preliminary. Retrieved from <https://www.cambridgeenglish.org/exams-and-tests/preliminary/>
5. National Geographic Learning (2025). Pathways: Listening, Speaking, and Critical Thinking – Intermediate Level. Retrieved from <https://www.eltngl.com/pathways>
6. TESOL International Association (2025). TESOL Resource Center. Retrieved from <https://www.tesol.org/resource-center/>

### **UHB23102 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.

### **UHB33102 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]. Schauer, G. A. (2024). Intercultural competence and pragmatics. Palgrave Macmillan. <https://doi.org/10.1007/978-3-031-44472-2>

**UHB11002      \*\*Malay Communication I (Foreign student only)**

*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, student 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.

**UHB1XX02      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.*

**UQI11202      Philosophy and Current Issues**

*Synopsis:*

Kursus merangkumi hubungan ilmu falsafah dengan Falsafah Pendidikan Kebangsaan dan Rukunegara. Penggunaan falsafah sebagai alat untuk memurnikan budaya pemikiran dalam kehidupan melalui seni dan kaedah berfikir serta konsep insan. Topik utama dalam falsafah iaitu epistemologi, metafizik dan etika dibincangkan dalam konteks isu semasa. Penekanan diberi kepada falsafah sebagai asas bagi menjalin dialog antara budaya serta memupuk nilai sepunya. Di hujung kursus ini pelajar akan mampu melihat disiplin-disiplin ilmu sebagai satu badan ilmu yang komprehensif dan terkait antara satu sama lain.

*References:*

1. Al-Attas, S.M. Naquib. (1991). The Concept of Education in Islam. Kuala Lumpur: ISTAC.
2. Al-Farugi, I.R. (1994). Al-Tawhid: Its Implications for Thought and Life, (2nd Ed.). Herndon: IIIT.
3. Phillips, D.C. (Ed.) (2014). Encyclopaedia of Educational Theory and Philosophy, (1st Ed.). SAGE Publication.
4. Dzulkifli, A.R. & Rosnani, H. (2019) Pentafsiran Baharu Falsafah Pendidikan Kebangsaan dan Pelaksanaannya Pasca 2020. Kuala Lumpur: IIUM Press.
5. Hospers, J. (1997). An Introduction to Philosophical Analysis, (4th Ed.). London: Routledge.
6. Mitchell, H.B. (2011). Roots of Wisdom: A Tapestry of Philosophical Traditions, (6th Ed.). Wadsworth: Cengage Learning.
7. Osman Bakar. (1999). The Classification of Knowledge in Islam. Cambridge, U.K.: The Islamic Texts Society.

8. Rosnani Hashim. (2017). Revitalization of Philosophy and Philosophical Inquiry in Muslim Education. Kull of Education, IIUM.
9. Solomon, R.C. & Higgins, K.M. (2010). The Big Questions: A Short Introduction to Philosophy, (8th Ed.). Wadsworth: Cengage Learning.
10. Weiming, T. & Ikeda, D. (2011). New Horizons In Eastern Humanism: Buddhism, Confucianism and The Quest for Global Peace. London: I.B.Tauris.

**UQU10702      \*Appreciation, Ethnics and Civilization (Local)**

*Synopsis:*

Kursus ini menerangkan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenalpasti sistem, tahap perkembangan, kemajuan dan kebudayaan sesuatu bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan professional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini. Di hujung kursus ini pelajar akan dapat menghubungkan etika dan kewarganegaraan berminda sivik.

*References:*

1. Shamsul Amri Baharuddin. (2012). Modul Hubungan Etnik Edisi Dua. Bangi: Institut Kajian Etnik. Universiti Kebangsaan Malaysia. [DS595 .M62 2007].
2. Dworkin, A.G. (1999). The minority report: An introduction to racial, ethnic and gender relations. Fort Worth: Harcourt Barce College Pub. [E184.A1 .M56 1999].
3. Holst, F. (2012). Ethnicization and identity construction in Malaysia. New York: Routledge. [DS595 .H64 2012 v. 12].
4. Wan Hashim Wan Teh. (2011). Hubungan Etnik di Malaysia. Kuala Lumpur: ITNM. [DS595.W36 2011].
5. Zaid Ahmad. (2010). Hubungan Etnik di Malaysia. Oxford Fajar: Shah Alam. [DS595 .H822010].
6. Mohd. Ashraf Ibrahim. (2004). Gagasan Bangsa Malayan yang Bersatu 1945-57. Bangi : Penerbit UKM. [DS597.M37 2004]
7. Noor Aziah Mohd. Awal. (2003). Pengenalan kepada Sistem Perundangan di Malaysia. Petaling Jaya: International Law Book Services. [KPG68.N66 2003]
8. Eow Boon Hin. 2008. Moral Education. Shah Alam: Longman. (LC268.E48 2008)
9. Ahmad Khamis. 1999. Etika Untuk Institusi Pengajian Tinggi. Kuala Lumpur: Kumpulan Budiman. (LC315.M3.A35 1999)
10. Mohd Nasir Omar. 1986. Falsafah Etika; Perbandingan Islam dan Barat. Kuala Lumpur: JPM. (BL240.3.H87 2009)

**UQI10102      Islamic Studies**

*Synopsis:*

This course explains the concept of Islam as al-Deen. The scope of his discussion covers the study of Ulum al-Quran and Ulum al-Hadith; Akidah Ahli Sunnah Wal Jamaah; the stream of religious thought; the development of the school of Fiqh; Islamic Family Fiqh, Property Muamalat Fiqh; Islamic Criminal Law; Morality and Tasawwuf.

*References:*

Rujukan Utama:

1. Abd Shakor dan Lain-lain (2017), Modul Pembelajaran Pengajian Islam (UQI10102/10602), cetakan keenam 2017, Batu Pahat: Penerbit UTHM.
2. Sirajuddin Abbas K.H, (2016), I'tiqad Ahlussunnah Wal-Jama'ah, Kota Bharu: Pustaka Aman Press Sdn. Bhd.
3. Wan Mohd. Khairul Firdaus Wan Khairuddin, et.al., (2020), Mazhab Syafi'i; Legasi dan Pengaruhnya di Malaysia, Terengganu: Penerbit UnisZA
4. Abdul Razak Mutalib, (2016), 40 Hadis palsu dan lemah, Kuala Lumpur: Penerbitan PTS
5. Syed Ahmad Syed Abdullah Al-'Idrus, (2015), Bidaah yang sebenar dalam Islam, Batu Pahat: Institut Ahli Sunnah WalJamah. (BP130.4 S23 2015)
6. Harun Din (Dr.) (2015), Manusia Dan Islam, cetakan pertama, Kuala Lumpur: Dewan Bahasa dan Pustaka. (BP174 .M36 2015)
7. Mustafa al-Khin, Mustafa al-Bugha & Ali Asy-Syarbaji (2014), Al-Fiqh Al-Manhaji Mazhab Al-Syafie, terjemahan Zulkifli al-Bakri et.al, Putrajaya: Jabatan Kemajuan Islam Malaysia.
8. al-Anjari, Fouzi (2013), Al-Asya'irah: Akidah Sebenar Ahli Sunnah Wal Jamaah, Seremban: Creative Publika. (BP166.14. A54 2013)
9. Ramli Awang (2013), Akidah Penghayatan Tauhid al-Quran, Johor: Penerbit UTM Press.

(BP165.5 R35 2013)

10. T. Nama (2013), Pengurusan, Etika Kerja dan Personaliti: Perspektif Islam, Perlis: UMP. (BP190.5.M28. P46 2013)

Rujukan tambahan:

11. Irwan Mohd Subri, (2011), Kajian Syariah dan Undang-undang, Negeri Sembilan: Universiti Sains Islam Malaysia. (KPG68. K34 2011)

12. Roziah Sidik (2011), Pengajian Islam, Selangor: Oxford Fajar. (BP42. R69 2011)

13. Mohd Fauzi Mohd Amin (2011), Pemerkasaan Fardhu Kifayah berteraskan al-Quran dan al-Sunnah, Negeri Sembilan: USIM. (BP130.8. P45 2011)

14. Roziah Sidik (2011), Pengajian Islam, Selangor: Oxford Fajar. (BP42. R69 2011)

15. Mohd Fauzi Mohd Amin (2011), Pemerkasaan Fardhu Kifayah berteraskan al-Quran dan al-Sunnah, Negeri Sembilan: USIM. (BP130.8. P45 2011)

16. Azzam, Abdul Aziz Muhammad (2010), Fiqh Muamalat: Sistem Transaksi dalam Fiqh Islam, Jakarta: Amzah. (BP158.C59. A99 2010)

17. Ismail Haji Ali, (1995), Pengertian dan Pegangan Iktikad yang benar: Ahli Sunnah Wal Jamaah: Kuala Lumpur: Penerbitan al-Hidayah. (BP166.78. P46 1995)

18. Abdur Rahman I Doi (1995), Undang-undang Syariah, terjemahan Rohani Abdul Rahim, Kuala Lumpur: Dewan Bahasa dan Pustaka. (BP173.6. A72 1995)

19. Mohammad Muslehudin (1989), Insuran dan Hukum Islam, Kuala Lumpur: Dewan Bahasa dan Pustaka. (BP190.5. I67 M65 1989)

## **UQI10102 Moral Studies**

### *Synopsis:*

Kursus ini menerangkan tentang konsep moral, akhlak, etika dan nilai serta kepentingannya dalam kehidupan seharian. Perbincangannya meliputi pembahagian, falsafah, piawai dan teori moral serta nilai-nilai murni agama besar di dunia. Moral dalam pelbagai bidang pekerjaan, etika dalam sains dan teknologi serta isu-isu moral semasa.

### *References:*

Rujukan Utama :

1. Abdullah Zhidi Bin Omar. 2018. Pengantar Pendidikan Moral: IPTYA, IPTS, IPG & Kolej. Kuala Lumpur: Sasbadi.
2. Abdullah Zhidi Omar; Mahdi Shuid. 2013. Pengantar Pendidikan Moral. Kuala Lumpur: Sasbadi.
3. Abdul Rahman. 2019. Pembentukan Nilai Moral Sejahtera dan Hubungannya dengan Konsep Rahmatan lil 'alamin. Kuala Lumpur : MAIWP&KIRKHS, IIUM.
4. Friedrich Nietzsche. 2015. Beyond Good And Evil. London: Penguins Books, LTD.
5. Mark Alfano. 2016. Moral Psychology: an Introduction. Cambridge: Polity Press.
6. Shuhairimi Abdullah. 2017. Prinsip Nilai Murni dari perspektif Islam. Kangar: Penerbit UniMap.

Rujukan Tambahan :

1. Eow Boon Hin. 2008. Moral Education. Shah Alam: Longman. (LC268.E48 2008)
2. Ahmad Khamis. 1999. Etika Untuk Institusi Pengajian Tinggi. Kuala Lumpur: Kumpulan Budiman. (LC315.M3.A35 1999)
3. Mohd Nasir Omar. 1986. Falsafah Etika; Perbandingan Islam dan Barat. Kuala Lumpur: JPM. (BL240.3.H87 2009)

Rujukan e-Book

1. E-Modul P&P Pengajian Moral (UTHM)

## **UQI10902 \*\*Islam in Malaysia (international)**

### *Synopsis:*

This course explains the knowledge about Islam in Malaysia. The scope of study includes the history of Islam in Malaysia; belief and practice of Muslims in Malaysia in accordance to aqidah Ahl Sunnah Wal Jamaah and Shafie Sect; Islamic institutions in Malaysia such as royal, social, political, financial and current Islamic issues.

### *References:*

1. Mohammed Ibrahim. (2000). The Administration of Islamic Law In Malaysia. Kuala Lumpur: Institute of Islamic Understanding Malaysia. KPG479.A56 2000
2. Kamarulnizam Abdullah. (2003). The Politics of Islam in Contemporary Malaysia. Bangi: Penerbit Universiti Kebangsaan Malaysia. BP63.M4 .K35 2003

3. Khaliq Ahmad. (2006). Management from Islamic Perspective. Kuala Lumpur: Penerbit UIA. BP190.5M28.K42 2006
4. Stauth, Georg. (2002). Politics and Cultures of Islamization in Southeast Asia: Indonesia and Malaysia in the Nineteen-nineties. Bielefeld: Transcript. BP63.I5 .S72
5. Hussin Mutalib (2008). Islam in Southeast Asia. Singapore: Institute of South East Asian Studies. BP63.A38 .H87 2008

Courses listed below are also part of University requirement:

UQU10902	*Integrity and Anti-Corruption (local)
UQU11802	**Malaysia Studies and Culture (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 for more information.on.*

## SYNOPSIS OF CORE MATHEMATICS COURSES

### **BEE11203      Ordinary Differential Equations**

#### *Synopsis:*

This course is mainly about the study of mathematical concept through the use of knowledge of differential equation. First, students will be introduced the concept of differential equation 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.

*Pre-requisite:* BEE 10103 Calculus

#### *References:*

1. Stroud, K. A., Booth, D. J. (2011). Advanced Engineering Mathematics. 5th Ed. USA: Palgrave Macmillan. Call number: TA330.S76 2011.
2. Stroud, K. A., Booth, D. J. (2007). Engineering Mathematics. 6th Ed. USA: Palgrave Macmillan. Call number: TA330 .S77 2007.
3. Abd Wahid M. R, Mohamad M.N. (2008). Differential Equations for Engineering Students. Malaysia: Comtech. Marketing Sdn. Bhd. Call number: QA372 .D38 1992, QA371 .D44 2002 N1.
4. Peter V. O'Neil. (2003). Advanced Engineering Mathematics. Thomson Brooks/Cole. Call number: TA330 .O53 2007, TA330 .O53 2003, TA330 .O53 1995, TA330 .O53 1993.

### **BEE20303      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.
2. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781264258338>
3. James Stewart, Daniel Clegg, and Saleem Watson (2021). Calculus: Metric Version. 9th ed. USA: Cengage Learning.
4. Deborah Hughes-Hallett, Andrew M. Gleason, William G. McCallum (2021). Calculus: Single and Multivariable, 8th ed. USA: Wiley
5. 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>
6. Robert T. Smith, and Roland B. Minton (2012). Calculus Early Transcendental Function (3rd Edition). New York: McGraw-Hill (QA303.2 .S644 2012)
7. Wrede, Robert, and Murray Spiegel (2010). Schaum's Outline of Advanced Calculus. 3rd ed. New York: McGraw-Hill. [Call number: QA303.2 .W74 2010]
8. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071623667>

### **BEE32402      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 Siau ,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>

**BEE32502            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 conclusion 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

### **BEE12202 Occupational Safety and Health**

#### *Synopsis:*

This course introduces students to knowledge and skills in occupational safety and health in workplace. Scope of study includes Health, Safety and Environment Managements: Introduction to OSH, OSHA (Amendment) 2022, FMA (Repealed) 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. Ismail Bahari. (2006). Pengurusan Keselamatan dan Kesihatan Pekerjaan. Edisi ke-2. McGraw Hill Education (Malaysia). Call number: T55.I85 2006
2. Goetsch, D. L. (2021). Occupational safety and health for technologists, engineers, and managers (9th ed.). Pearson.
3. Brauer, R. L. (2022). Safety and health for engineers (4th ed.). Wiley.
4. Friend, M. A., & Kohn, J. P. (2018). Fundamentals of occupational safety and health (7th ed.). Government Institutes.
5. Singh, H. (2021). Decades of occupational safety and health in Malaysia. University of Malaya Press.
6. Sariwati, M. S. (2011). Occupational safety and health management: Using new OBE curriculum. Universiti Teknologi MARA.

### **BEE22402 Creativity and Innovation**

#### *Synopsis:*

This course equips students with creative problem-solving and innovative thinking skills, preparing them for future decision-making. It introduces methodologies like Design Thinking and Theory of Inventive Problem Solving (TRIZ), teaching students to approach challenges empathetically and systematically. By analyzing industry problems, addressing contradictions, and fostering innovation, students learn to develop inventive solutions. They will also gain practical experience through exhibitions and competitions. Additionally, they will build a professional presence by preparing resumes, video resumes, and LinkedIn profiles, ensuring they are well-prepared for industry demands and career opportunities from their first year of university.

#### *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)
5. Kai Yang (2005) Design for Six Sigma for Service, 1st Edition ISBN 9780071445559, MacGraw-Hill Education
6. Kyriaki Papageorgiou, Olga Kokshagina. (2022). Envisioning the Future of Learning for Creativity, Innovation and Entrepreneurship. Berlin : De Gruyter. Retrieved from <https://eds.p.ebscohost.com/eds/detail/detail?vid=3&sid=f57b3ebc-9939-4aab-af76-9958eaff92cf%40redis&bdata=JnNpdGU9ZWRzLWxpdmUmc2NvcGU9c2I0ZQ%3d%3d#AN=3307519&db=nlebk>
7. Charles Prather (2010) Manager's Guide to Fostering Innovation and Creativity in Teams, 1st Edition, McGrawHill. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071627979/front-matter/preface1>
8. Kai Yang (2005) Design for Six Sigma for Service, 1st Edition, McGrawHill. ISBN: 9780071445559 <https://www-accessengineeringlibrary->

com.ezproxy.uthm.edu.my/content/book/9780071445559/chapter/chapter9

9. Issac Lim Sing Sheng (2023) Improving Product Ideation Among Engineering Undergraduates Using TRIZ and Design Thinking ISBN:979-8-3503-0742-9 <https://ieeexplore-ieee-org.ezproxy.uthm.edu.my/stamp/stamp.jsp?tp=&arnumber=10264033>
10. Reilly Ger;Murphy Mike;Nagy Balázs Vince;Järvinen Hannu-Matti (2023) Multicultural Online Collaborative Learning: Students' Engagement in Design Thinking Framework ISBN: 978-1-5231-5735-8 <https://app.knovel.com/hotlink/pdf/rcid:kpBPACese1/id:kt013GRO5D/book-proceedings-51st/multicultural-online?kpromoter=federation>

### **BEE22503            Engineering Economic 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, Pearson, 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

### **BEE30103            Engineering Management**

#### *Synopsis:*

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

#### *References:*

1. Lucy C. Morse, Daniel L Babcock (2023), Managing Engineering and Technology, 7th Edition, Upper Saddle River, Pearson. [Call Number TA190 .M68 2023].
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 (2021), Project Management: Processes, Methodologies and Economics, 3rd Edition, Upper Saddle River, Pearson. [Call Number TA190. S57 2021].

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. Mohamed Ben-Daya, Salih O. Duffuaa, Abdul Raouf, Jezdimir Knezevic, Daoud Ait-Kadi (2009), Handbook of maintenance management and engineering, New York: Springer. [Call Number TS192 .H37 2009].
6. D.R. Kiran (2022), Principles of Economics and Management for Manufacturing Engineering. Elsevier. [https://www.sciencedirect-com.ezproxy.uthm.edu.my/book/9780323998628/principles-of-economics-and-management-for-manufacturing-engineering#book-info](https://www.sciencedirect.com.ezproxy.uthm.edu.my/book/9780323998628/principles-of-economics-and-management-for-manufacturing-engineering#book-info)
7. Albert Lester (2021), Project Management, Planning and Control Managing Engineering, Construction and Manufacturing Projects to PMI, APM and BSI Standards. Elsevier. <https://www-sciencedirect.com.ezproxy.uthm.edu.my/book/9780128243398/project-management-planning-and-control>

**BEE32302            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. 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).
2. 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)
3. SerdarAsan, Ş. & Işıklı, E. (Eds.). (2020). Engineering Education Trends in the Digital Era. IGI Global. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-7998-2562-3>
4. Murthy, J. N., C., L., & Kosaraju, S. (2020). Ethics in Engineering Profession: Pedagogy and Practices. In K. Kumar & J. Davim (Eds.), Methodologies and Outcomes of Engineering and Technological Pedagogy (pp. 296-318). IGI Global. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-7998-2245-5.ch014>
5. Clark, R. P. & Andrews, J. (2019). Engineers for Industry: Challenges, Solutions, and Future Ideas. In E. Smirnova & R. Clark (Eds.), Handbook of Research on Engineering Education in a Global Context (pp. 35-45). IGI Global. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-5225-3395-5.ch004>
6. Guideline for Code of Professional Conduct (BEM/RD/PPC/08) Date: 27.10.2016 <http://www.bem.org.my/code-of-professional-conduct#:~:text=Print%20Code%20of%20Professional%20Conduct.%20MORE.%20Board%20of>

## SYNOPSIS OF CORE PROGRAMME COURSES

### BEV10102 Computer Programming

#### *Synopsis:*

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

#### *References:*

1. Harper. A, Ryan.L, Stephen. S, Michael B., Daniel F., Huáscar T., and Moses F. (2022). Programming Survival Skills. Chap. 2 in Gray Hat Hacking: The Ethical Hacker's Handbook. 6th ed. New York: McGraw-Hill. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781264268948/chapter/chapter2>
2. Boussaha, K., Hanneche, A., & Chaoua, Z. (2022). Computer Programming Practical Works Activities: From Human to Automatic Scoring. In J. Zhao & J. Richards (Eds.), Virtual Technologies and E-Collaboration for the Future of Global Business (pp. 154-181). IGI Global. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-6684-5027-7.ch009>
3. Management Association, I. (Ed.). (2021). Research Anthology on Recent Trends, Tools, and Implications of Computer Programming. IGI Global. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-7998-3016-0>
4. 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

### BEV10303 Electric Circuit I

#### *Synopsis:*

This course provides a comprehensive overview of essential concepts and principles in electrical circuits including basic laws and circuits analysis techniques. Topics covers fundamental definitions including units, electric charge, voltage, current, power, and energy. The Ohm's Law, Kirchhoff's Laws will be studied alongside series and parallel resistor circuits, voltage and current division, and power calculations. Electrical circuit analysis techniques and concepts will be covered through mesh and nodal circuit analysis, circuit reduction techniques Thevenin's Theorem, Norton's Theorem, maximum power transfer theorem and Superposition theorem. Topics also include instantaneous current and voltage, average and effective values of periodic signals, and average power absorbed by ideal resistors.

#### *References:*

1. Alexander, C. K. & Sadiku, M.N.O.; Fundamentals of Electric Circuits; McGraw-Hill 5th 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
6. Nahvi, Mahmood, and Joseph A. Edminister. 2018. Schaum's Outline of Electric Circuits. 7th ed. New York: McGraw-Hill Education.<https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260011968>
7. Patrick, Dale R. Fardo, Stephen W. Richardson, Ray E. Chandra, Vigyan (Vigs). (2022). DC/AC Electrical Fundamentals. River Publishers. <https://app.knovel.com/hotlink/toc/id:kpDCACEF01/dc-ac-electrical-fundamentals/dc-ac-electrical-fundamentals>

### BEV10403 Electric Circuit 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 include 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. The two-port network topic is also introduced for advanced circuit analysis.

*Pre-requisite:* BEV10303 Electric Circuits I

**References:**

1. Alexander, C. K. & Sadiku, M.N.O.; Fundamentals of Electric Circuits; McGraw-Hill 5th Ed.; 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 9th Ed.; 2011. Call number : TK454 .N54 2011
4. William H Hayt & Jack E Kemmerly, Engineering Circuit Analysis, McGraw Hill, 2002. Call number : TK454 .I78 2011
5. Wang, Meizhong. (2019). Understandable Electric Circuits - Key Concepts (2nd Edition).Institution of Engineering and Technology (The IET). Retrieved from <https://app.knovel.com/hotlink/toc/id:kpUECKCE03/understandable-electric/understandable-electric>
6. Gibilisco, Stan, and Simon Monk. 2022. "Direct-Current Circuit Analysis." Chap. 5 in Teach Yourself Electricity and Electronics. 7th ed. New York: McGraw Hill. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781264441389/chapter/chapter5>
7. Malik, Om. 2015. Handbook of Electric Power Calculations. 4th ed., edited by H. Wayne Beaty and Surya Santoso. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071823906>
8. Yang, Won Y. Kim, Jaekwon Park, Kyung W. Baek, Donghyun Lim, Sungjoon Joung, Jingon Park, Suhyun Lee, Han L. Choi, Woo June Im, Taeho. (2020). Electronic Circuits with MATLAB®, Pspice®, and Smith Chart - 8.1.1 Definitions and Examples of Two-Port Parameters. (pp. 678). John Wiley & Sons. Retrieved from <https://app.knovel.com/hotlink/pdf/id:kt012EQK51/electronic-circuits-with/definitions-examples>

**BEV10503 Analog Electronics**

**Synopsis:**

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

**Pre-requisite:** BEV10303 Electric Circuits I

**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 Malvino, David J. Bates, Patrick E. Hoppe, Electronic Principles, 9th Ed., McGraw Hill, 2021. ISBN 978-1-260-57056-4
4. John Bird, Electrical and Electronic Principles and Technology, 6th Ed., Routledge, 2017. ISBN: 9781138673526
5. S. Salivahanan, Basic Electronics and Devices, McGraw-Hill Education, 2018. ISBN: 9789353160944
6. Ram Niwas (IES), Electronic Devices And Analog Electronics, Vol 1., 2021.
7. D.I. Crecraft and S. Gergely (2002). Analog Electronics Circuits, Systems and Signal Processing. Elsevier. <https://www-sciencedirect-com.ezproxy.uthm.edu.my/book/9780750650953/analogelectronics>

**BEV10603 Digital Electronics**

**Synopsis:**

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

**References:**

1. Thomas L. Floyd. (2013). Digital fundamentals : a systems approach . Boson : Pearson. Call number: TK7868.D5 .F56 2013

- Richard S. Sandige, Michael L. Sandige (2012). Fundamentals of digital and computer design with VHDL. New York : McGraw Hill. Call Number: TK7868.D5 .S26 2012
- William J. Dally, R. Curtis Harting (2012). Digital design : a systems approach. Cambridge : Cambridge University Press. Call Number: TK7868.D5 .D34 2012
- Stephen Brown and Zvonko Vranesic (2014). Fundamentals of digital logic with Verilog design. Dubuque : McGraw-Hill Higher Education, Ltd. Call number: TK7868.L6 .B76 2014
- M. Rafiquzzaman (2014). Fundamentals of digital logic and microcontrollers. Wiley. Call Number: TK7888.4 .R34 2014
- Guy Even, Moti Medina (2012). Digital logic design : a rigorous approach. Cambridge : Cambridge University Press. Call number: TK7868.L6 .E83 2012
- Tertulien Ndjountche (2016). Digital Electronics 1 : Combinational Logic Circuits, John Wiley & Sons, Incorporated, 2016. ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=4560567>.
- Larry Massengale (2018), Digital Systems Design, Volume III : Latch-Flip-Flop Circuits and Characteristics of Digital Circuits, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=5639119&query=flip%20flop>
- Larry Massengale (2018), Digital Systems Design, Volume II : Developmental Methods and Combinational Logic Circuits, <https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=5639116&query=digital%20logic>

### **BEV20103      Electrical Measurement and Instrumentation**

#### *Synopsis:*

*The course Instrumentation and Measurement (BEJ10702) introduces fundamental concepts in measurement and instrumentation. It covers key topics such as units and dimensions, measurement standards, types of errors, calibration methods, and noise analysis. The course emphasizes the use of measurement devices, including galvanometers, ammeters, voltmeters, wattmeters, and sensors for temperature, force, torque, and pressure. Students will gain simulation skills in using oscilloscopes for voltage, frequency, and phase measurement and will explore advanced instrumentation systems using tools like MATLAB and LabVIEW. The course also highlights the integration of sensors into practical instrumentation applications and the design of precise measurement systems.*

#### *References:*

- Sivaraman P.;Sharmeela C.;Nayagi A. Thaiyal;Mahendran R.Basic Electrical and Instrumentation Engineering,2021. <https://app.knovel.com/hotlink/pdf/rcid:kpBEIE0002/id:kt012IR2D4/basic-electrical-instrumentation/electrical-electronic?kpromoter=federation>.
- R. G. Gupta, *Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting*, McGraw Hill, 2001. Call number: TK7870.2G86 2001
- L. D. Jones, and C. A. Foster, *Electronic Instruments and Measurements. Prentice Hall International Edition*, 1991. Call number: TK7878.4 .J66 1991
- D. A. Bell, *Electronic Instrumentation and Measurements, 2nd Edition. Prentice Hall Career and Technology*, 1994. Call number: TK7878 .B45 1994

### **BEV20203      Transform Circuit**

#### *Synopsis:*

This course provides further study in the analysis of linear circuits using advanced mathematics. Topics include mathematical representation and operations on signal waveforms, time domain circuit analysis using the convolution integral, transient and steady-state analysis of circuits using Laplace transform, steady-state analysis of circuits using Fourier series, transient and steady-state analysis of circuits using Fourier transform.

*Pre-requisite:*      BEE 11203 Ordinary Differential Equations

#### *References:*

- Irwin J D, Basic Engineering Circuit Analysis, MacMillan Publishing Co. 2011. Call Number: TK454 .I78 2011
- Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, 5th Edition, McGraw-Hill, 2013. Call Number: TK454. A3 20133.
- Hart W A, Kemmerly J E, Durbin S M, Engineering Circuit Analysis, McGraw-Hill 2007. Call Number: TK454 .H39 2007
- DeCarlo R A, Pen-Min Lin, Linear Circuit Analysis, Prentice Hall, 2002. Call Number: TK454. D33 2002

5. James W N and Susan A R. Electric Circuits, 9th Edition, Addison Wesley 2011. Call Number: TK454 .N54 2011

### **BEV20303 Electromagnetics Fields and Waves**

#### *Synopsis:*

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

*Pre-requisite:* BEV20303 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. Engineering Electromagnetics, William H. H, McGraw-Hill, 7th ed.: McGraw-Hill, 2006. Call Number: QC670 .H39 2006
4. Electromagnetics for Engineers, Fawwaz T. Ulaby, Pearson Education, 2005. Call Number: QC760. U424 2005
5. Fundamentals of engineering electromagnetics, Bansal, Rajeev, Boca Raton, FL: Taylor & Francis, 2006. Call Number: QC760. F86 2006

### **BEV20403 Polyphase Circuit**

#### *Synopsis:*

This course introduces the fundamental concepts on electrical polyphase system. It starts with the concept of polyphase voltage generation, followed by three-phase 4-wire and 3-wire systems. Balanced and unbalanced systems will be covered, as well as  $\Delta$ -Y transformation and three-phase complex power calculations. Single-line diagram will be introduced, followed by three-phase transformers, transmission line models and per-unit system.

#### *References:*

1. Chapman Stephen J, Electric Machinery and Power System Fundamentals, McGraw-Hill, 2012. Call Number: TK2000 .C42 2012
2. Theodore Wildi, Electrical Machines, Drives and Power Systems, Prentice Hall, 2006. Call Number: 182 .W54 2006
3. Timothy L. S, William E. D., Electrical Power and Controls, 2nd Edition, Prentice Hall, 2004. Call Number: TK1001 .S48 2004
4. Hadi Saadat, Power System Analysis, 2nd Edition, Prentice Hall, 2002. Call Number: TK1011 .S33 2002  
Chapman Stephen J, Electric Machinery and Power System Fundamentals, McGraw-Hill, 2012. Call Number: TK2000 .C42 2012

### **BEV20501 Electric Engineering Laboratory I**

#### *Synopsis:*

The purpose of this course is to introduce the students about the basic concepts of electrical wiring installations including installation of lighting circuit, power circuit and electrical supply system. The methods of measuring DC and AC circuits using various types of measurements meters are also covered in this course. The contents of this course consists of Electrical Wiring Installation for Lighting Circuit, Electrical Wiring Installation of Power Circuit, Electrical Wiring Installation for Electrical Supply System Belong From KWh Meter to Consumer Control Unit, Basic Statistical Sampling, Measurement Using DC Bridges, Power Measurement of DC and AC Single Phase Load, Basic Electrical Measurement Using DC Source, Basic Electrical Measurement Using AC Source and AC Voltage Measurement by Using Oscilloscope.

#### *References:*

1. Alexander (2009). Sadiku, Fundamentals of Electric Circuits, 3rd Ed., McGraw Hill. Call Number:

- TK454. A43 2009.Floyd, Thomas L. (2010). Electrical Circuits Fundamentals, NJ Pearson. Call Number: TK454 .F56 1020
- Boylestad (2010). Introductory Circuit Analysis, 11th Edition, NJ Pearson. Call Number: TK454 .B69 2010.
  - James W. Nilsson, Susan A. Riedel (2008). Electric Circuits, 7th Ed., Upper Sadle River, NJ Pearson. Call Number: TK454 .N54 2008.
  - James W. Nilsson, Susan A. Riedel (2002). Introductory circuits for electrical and computer engineering, Addison Wesley. Call Number: TK7867. N54 2002.

**BEV20602 Mechanical Sciences**

*Synopsis:*

This course shall introduce fundamental topics in mechanical engineering sciences that are related to electrical engineers in professional practice. Understanding fundamental areas of discussion in mechanical sciences is useful for electrical engineers especially in multi-disciplinary applications.

*References:*

- Meriam, J. L., Engineering Mechanics 7th Edition, John Wiley. Call Number: TA350 .M47 2013.
- Munson, Bruce R., (2013), Fluid Mechanics, 10th Edition, John Wiley. Call Number: TA357 .M86 2013.
- Cengel, Yunus A., (2011), Thermodynamics: An Engineering Approach, 7th Edition, McGraw Hill. Call Number: TJ265 .C46, 2011.
- Ashby, Michael F., Material selection in mechanical design, 9780081005996, 5th Ed, Elsevier Ltd., 2017, Call Number: TA403.6.A73, 2017.
- Kalpakjian, Serope, Manufacturing engineering and technology, 7th Edition, 2014, 9789810694067, Call Number TS176. K34, 2014.
- Samya Bano Zain. Thermodynamics and Statistical Mechanics : An Introduction for Physicists and Engineers. 2021. Institute of Physics Publishing, eBook ISBN 9780750346085.
- Ping YI, Jun LIU, and Feng JIANG. Engineering Mechanics. 2022. EDP Sciences, eBook ISBN 9782759829026.

**BEV20903 Power Generation, Transmission and Distribution**

*Synopsis:*

The aim of this course is to provide students with a systematic understanding of the operation of a modern electrical power network which consists of the generation, transmission and distribution. The topics include various types of power generation technologies, a study of elements of transmission and distribution, the constants of transmission, the types of transmission system and the ac distribution.

*References:*

- Charles K. Alexander, Matthew N. O. Sadiku, Fundamentals of Electric Circuits (5th Edition), McGraw-Hill 2013.
- Hadi Saadat, Power System Analysis (3rd Edition), PSA Publishing 2010.
- Leonard L.Grigby, Boca Raton Taylor and Francis, Electric Power Generations, Transmission and Distribution, 2007. Call number: TK1001.E43 2007.
- Paul Breeze, Power Generation Technologies, Elsevier, 2005. Call number: TK1001.B74 2005.
- Mohamed E. El-Hawary, Electrical Energy System, 2nd Ed., Taylor & Francis, 2007. Call number: TK1001.E36 2000 N1.

**BEV20803 Electrical Machines**

*Synopsis:*

This course is designed to give student a strong understanding of the fundamental principles of operation and characteristics of the following types of electrical machines – transformers, DC motors and generators, single-phase AC motor, three-phase AC motors, synchronous generators, special motors In this course the physical nature of electromagnetic phenomena in electrical machines is discussed on the basis of the respective mathematical apparatus and the main relationships from electrical machines theory are derived. Finally, some practical applications of electrical machines in electric power engineering and electric drives are explored.

*References:*

1. Zorbas, Dino; Electric Machines: Principles, Applications and Control Schematics, 2nd Ed.; Cengage, Australia, 2015. [TK2000. Z67 2015]
2. Sen, P. C.; Principles of Electric Machines & Power Electronics, 3rd Ed.; Hoboken, NJ: John Wiley, 2014. [TK2000. S46 2014]
3. Bhattacharya, S. K; Electrical Machines, 4th Ed.; Tata McGraw-Hill, 2014. [TK2000. B42 2014]
4. Wasynczuk, Oleg; Analysis of Electric Machinery & Drive Systems, 3rd Ed.; Institute of Electrical and Electronics Engineers, 2013 [TK2181. A52 2013]
5. Hughes, Austin; Electric Motors And Drives: Fundamentals, Types And Applications, 4th Ed.; Oxford: Newnes, 2013. [TK2514 .H83 2013]
6. Gönen, Turan; Electrical Machines with MATLAB, 2nd Ed.; Boca Raton, FL: CRC Press, 2012 [TK2000. G66 2012]
7. Mohan, Ned; Electric Machines and Drives: A First Course; Hoboken, NJ: Wiley, 2012. [TK2000 .M63 2012]

**BEV20901          Electrical Engineering Laboratory II**

*Synopsis:*

This course is arranged to give the students approaches on laboratory works in electrical parameter measurement of AC and DC system, steady-state behaviour of RLC loads in series and parallel connections, electrical parameters of single and three phase transformers, star and delta connection of three phase AC system and induction and DC electric motors. Examples of experiments are transformer characteristic study, three phase circuit, steady-state behaviour of RLC series and parallel circuits, and characteristic test of induction motor and DC motor.

*References:*

1. Alexander (2009). Sadiku, Fundamentals of Electric Circuits, 3rd Ed., McGraw Hill. Call Number: TK454 .A43 2009.
2. Floyd, Thomas L. (2010). Electrical Circuits Fundamentals, NJ Pearson. Call Number: TK454 .F56 2010
3. Boylestad (2010). Introductory Circuit Analysis, 11th Edition, NJ Pearson. Call Number: TK454 .B69 2010.
4. James W. Nilsson, Susan A.Riedel (2008). Electric Circuits, 7th Ed., Upper Sadle River, NJ Pearson. Call Number: TK454 .N54 2008.
5. James W. Nilson, Susan A. Riedel (2002). Introductory circuits for electrical and computer engineering, Addison Wesley. Call Number: TK7867 .N54 2002.

**BEV30103          Electronic Communication Systems**

*Synopsis:*

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

*References:*

1. Wayne Tomasi, Electronic Communication Systems: Fundamental Through Advanced 5th Ed., Pearson Prentice Hall, 2004. Call number: TK5101. T65 2004
2. Jeffrey S. Beasley, Gary M. Miller, Modern Electronic Communication 9th Ed., Pearson Prentice Hall 2008. Call number: TK5101 .B42 2008
3. Proakis, J. G., Salehi M., Communication System Engineering 2nd Ed, Pearson Prentice-Hall, 2002. Call number: TK5101. P75 2002 N1
4. Couch, L. W., Digital and Analog Communication Systems, 7th Ed, Pearson Prentice-Hall, 2007. Call number: TK5101 .C68 2007
5. Louis Frenzel, Communication Electronics, McGraw-Hill, 2001. Call number: TK7816 .F67 2001 N8
6. Ziemer, R. E., et. al., Principles of Communication, 5th Ed, John Wiley, 2010.

### **BEV30203      Power Electronics**

#### *Synopsis:*

This subject discusses about the types of solid state switching components, the working of various types of converter circuits and the associated control circuits. It also touches on the principles of AC and DC motor speed control. The use of solid state components in handling high voltage DC is also dealt with. Lastly the applications of switching devices and examples in industry are being discussed.

#### *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

### **BEV30903      Power System Analysis**

#### *Synopsis:*

This course discusses the fundamentals of analytical tools used to analyze the power system in various operating conditions. First, the course covers the modeling of power system components to represent the actual system response. The course covers the breadth and depth of various analytical tools such as power flow analysis, optimal dispatch of generation, balanced fault analysis, and power system stability to study the system response in steady-state and transient operating situations.

#### *References:*

1. Hadi Saadat, Power System Analysis (2th Edition), McGraw-Hill, 2004. Call number: TK1011.S33 2002
2. Arthur R. Bergen & Vijay Vittal, Power Systems Analysis (2th Edition), Pearson Prentice Hall, 2000. Call number: TK1001. B47 1986 N2, TK1001. B47 1986, TK1001 .B47 1986 N3
3. John J. Grainger & William D. Stevenson, Power System Analysis. McGraw-Hill, 2004. Call number: TK3001. G73 1994
4. Stephen J. Chapman, Electric Machinery and Power System Fundamentals, McGraw-Hill, 2002. Call number: TK2000.C462 2002

### **BEV30401      Power Engineering Laboratory I**

#### *Synopsis:*

This course is a practical lab which is related to Power Electronics, Power System and Control System Theory. This course aims to prepare student with practical knowledge and skills in the electrical and electronic equipment's used in industry. It is important for students to be familiar with electrical and electronics equipment as a prior preparation to adapt related working environment.

#### *References:*

1. Timothy L. S, William E. D., Electrical Power and Controls, 2nd Edition; Prentice Hall, 2004.
2. Muhammad H. Rashid, Power Electronic Circuit, Devices and Applications, 3rd Edition; Prentice Hall, 2004.
3. E.Acha, V.G Agelidis, O. Anaya-Lara, T.J.E Millwer, Power Electronics Control in Electrical System Newnes, 2002
4. V.R. Moorthi, Power Electronics Devices, Circuits, and Industrial Applications, Oxford University Press, 2005
5. Ned Mohan, William P. Robbins, Tore M. Undeland, Power electronics: Converters, Applications and Design, John Wiley, 2003

**BEV30503      Control Systems***Synopsis:*

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

*Pre-requisite:*      BEE11203 Ordinary Differential Equations

*References:*

1. N. S. Nise. Control Systems Engineering, 6th Edition. 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 Edition. John Wiley, 2010. Call number: TJ213 .K86 2010
4. M. Gopal. Control Systems: Principle and Design, 2nd 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

**BEV30603      Digital Signal Processing***Synopsis:*

This course aims is 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:*      BEV20203 Transform Circuit

*References:*

1. Digital Signal Processing: A modern Introduction, Ashok Ambardar, International Student Edition, Thomson, 2007. Call Number: TK5102.5.A43 2007
2. Digital Signal Processing: Principles, Algorithm and Applications, John G. Proakis, Dimitris G Manolakis, 4th Ed, Pearson Prentice Hall, 2007.
3. Analog and Digital Signal Processing, Ashok Ambardar, 2nd Ed, Thomson, 1999. Call Number: TK5102.9.A43 1999

**BEV30703      Electric Drives***Synopsis:*

This subject deals with the fundamental of electric drives and its applications in industries. It begin with the components involve in electric drives the way to chose the correct drives system. The various power electronics converters and the control schemes are also covered. Modern traction, solar and battery drives in electrical drives are delivered considering current and future needs of the industry. Lastly, the digital control implementation for electric drives system is taught in general.

*References:*

1. GK Dubey, Fundamental of Electrical Drives, 2nd Edition, Alpha Science Int. Ltd. 2001. Call Number: TK4058 .D83 2001

2. Theodore Wildi, Electrical Machines, Drives and Power Systems; Prentice Hall, 2006. Call number: TK2182 .W54 2006
3. B.K. Bose, Modern Power Electronics and AC Drives, Prentice Hall, 2002. Call Number: TK2781 .B67 2002
4. Mohamed A. E., Fundamentals of Electric Drives; Brooks/Cole Publishing, 2000. Call number: TK4058 .E74 2000 N3, TK4058 .E74 2000 N4, TK4058 .E74 2000 N5. TK4058 .E74 2000
5. Ion Boldea and S.A. Nasar, Electric Drives, 2nd Edition; Taylor & Francis, 2006. Call number: TK4058 .B64 2006
6. W. Leonhard, Control of Electrical Drives, Springer, 2001. Call Number: TK4058 .L46 2001
7. M.H. Rashid, Power Electronics: Circuits, Devices, and Applications, Prentice Hall 2006. Call Number: TK7881.15 .P67 2006
8. Slobodan N. Vukosavic, Digital Control of Electrical Drives, Springer, 2007. Call Number: TK4058 .V84 2007 \
9. Chee-Mun Ong, Dynamic Simulation of Electric Machinery Using Matlab/Simulink, Prentice Hall 1997. Call Number: TK2391 .O54 1998.

### **BEV30803      Utilisation of Electrical Energy**

#### *Synopsis:*

This course deals with topics related to the utilisation of electrical energy: building distribution networks and electricity tariffs, building services, power factor and power quality issues, voltage drop and short circuit issues, building protections and illuminating engineering. In general, this course focuses on technical issues that relevant to the utilisation of electrical energy, which addresses areas concerning the power supply utilities, power equipment and protection systems applied in electrical installations.

#### *References:*

1. Hemant Joshi, Residential, Commercial and Industrial Electrical Systems (Vol. 3 – Protection, Testing and Commissioning), Tata McGraw-Hill Publishing Company Limited, 2008. Call Number: TK1001 .J67 2008 v.3.
2. Dugan, Roger C., Electrical Power Systems Quality, McGraw Hill, 2012. Call Number: TK1010 .E43 2012.
3. Karlen, Mark., Lighting Design Basics, Hoboken : Wiley , 2012. Call Number: TH7703 .K37 2012.
4. Gupta, J. B., Utilization of Electric Power and Electric Traction : A Course in Electrical Power, S. K. Kataria, 2004. Call Number: TK4001 .G86 2004.
5. Atkinson, Bill, Electrical Installation Designs (4th Edition), John Wiley & Sons, 2013. Call Number: TK3271 .A84 2013.
6. Hemant Joshi, Residential, Commercial and Industrial Electrical Systems (Vol. 1 – Equipment and Selection), Tata McGraw-Hill Publishing Company Limited, 2008. Call Number: TK1001 .J67 2008
7. Scaddan, Brian, Milton Park, Abingdon, Oxon, 17th edition IET wiring regulations: design and verification of electrical installations (8th Edition), New York : Routledge, 2013.
8. Steffen, Marcus, Residential lighting design; New York : Crowood, 2014.
9. Electricity Supply Act 1990 (Act 447), Electricity Supply (Successor Company) Act 1990 (Act 448) & Regulations, International Law Book Services, 2016.
10. TNB's Electricity Supply Application Handbook, 2007.

### **BEV30901      Power Engineering Laboratory II**

#### *Synopsis:*

This course is arranged to teach students the practical aspects of electric drives, power system operations, and power system protection devices. Among the contents of the syllabus is the application of inverter to drive motor. This course is also focusing on the characteristic of overhead transmission lines under load and no load condition. Another major topic covered is various protection devices of the power system distribution network. Examples of experiments are air circuit breaker test, application of overcurrent and earth fault relay as well as induction motor acceleration control using an inverter.

*References:*

1. Shoaib Khan, Industrial Power Systems. CRC Press, 2008. Call number: TK1005 .K42 2007.
2. Ali Emadi, Energy-efficient Electric Motors, 3rd. Edition, Marcel Dekker, 2005. Call number: TK2511.E42 2005
3. R.B. Theodore. Electrical Systems Design, Prentice Hall, 2003. Call number: TK3101 .B67 2003
4. T.A. Short, Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006. Call number: TK3091 .S56 2006
5. GK Dubey, Fundamental of Electrical Drives, 2nd Edition, Alpha Science Int. Ltd. 2001. Call Number: TK4058 .D83 2001
6. T. Wildi, Electrical Machines, Drives, and Power Systems, Prentice Hall, 2006. Call Number: TK2182 .W54 2006
7. B.K. Bose, Modern Power Electronics and AC Drives, Prentice Hall, 2002. Call Number: TK2781 .B67 2002
8. W. Leonhard, Control of Electrical Drives, Springer, 2001. Call Number: TK4058 .L46 2001
9. John J. Grainger & William D. Stevenson, Power System Analysis. McGraw-Hill, 2004. Call number: TK3001 .G73 1994

**BEV40103      Power System Protection**

*Synopsis:*

The course discusses the methodology required to provide necessary protection to the power system against abnormal operating conditions. First, the method to determine the appropriate instrument transformer rating for the protection system is discussed. Next, the fundamental of sequence components and the fault analysis technique are studied. Consequently, the course discusses the approach to determine the typical power system protection scheme, such as overcurrent, distance, and differential relay.

*Pre-requisite:*      BEV20703 Power System Analysis

*References:*

1. Paul M. Anderson, Power System Protection, McGraw-Hill, 1999. Call number: TL1010.A63, 1999.
2. Ravindra P. Singh, Digital Power System Protection, Pearson Prentice Hall, 2007. Call number: TK1005.S617.S56, 2007.
3. Waldemar Rebizant, Digital Signal Processing in Power System Protection and Control. Springer, 2011. Call number: TK1005.R42, 2011.
4. Arun G. Phadke, Computer Relaying for Power Systems, John Wiley, 2009. Call number: TK2861.P42, 2009.
5. Stanley H. Horowitz, Power System Relaying, Wiley, 2008. Call number: TK2861.H67, 2008.

**BEV40203      Industrial Power Systems**

*Synopsis:*

Industrial Power Systems is a must-have course for anyone involved in power engineering, especially in the design and maintenance of power distribution systems. This course is arranged to furnish students' understanding of the utilisation of electrical energy in industrial applications. The industrial power distribution system generally represents a relatively small portion of the entire plant cost (5% to 10%), yet the production and output of the other 90% to 95% of plant investment is dependent on the service delivered by that investment in the power distribution system. Thus, it is vital for a power engineer to know the features and design procedures of industrial power systems, including basic plant planning, load estimation, instrument transformers, protective devices, power cables, power monitoring and control, as well as the energy management and control.

*References:*

1. Anton, Janssen. Switching in power transmission and distribution systems. Wiley, 2015. (Call number: TK2831.S94 2015).

- Thorpe, Dave. Energy Management in Industry: the Earthscan expert guide. Earthscan expert series, 2014. (Call number: TJ163.3.T47 2014).
- Anton, Janssen. Switching in Power Transmission and Distribution Systems, Wiley, 2015. (Call number: TK2831.S94 2015).
- Dugan, Roger C. Electrical power systems quality (3rd. Edition). McGraw Hill, 2012. (Call number: TK1010 .E43 2012).
- Baker, Thomas E. Electrical Calculations and Guidelines for Generating Stations and Industrial Plants. CRC Press, 2012. (Call number: TK1191.B34 2012).
- Thollander, Patrik. Improving energy efficiency in industrial energy systems: an interdisciplinary perspective on barriers, energy audits, energy management, policies, and programs. Springer, 2013. (Call number: TJ163.3.T46 2013).
- Nowakowski, Andrzej, Electric power transformer engineering. United Kingdom: Auris Reference, 2015. (Call number: TK2551 .E44 2015).

### **BEV40302 Power Engineering Laboratory III**

#### **Synopsis:**

*This course aims for a better understanding of the power factor correction under different load settings, relay settings for power system scheme, electrical machines that concern with the synchronous motor, adaptation of power electronic technology for loads control and relay testing.*

#### **References:**

- Dale R. Patrick, Stephen W. Fardo, Brian W. Fardo, *Electrical Power Systems Technology*, River Publishers, 2022. [<https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=29002966&query=electrical%20measurement>]
- Bhattacharyya, Mrittunjay, *Electrical Machines Modelling & Analysis*, PHI Learning Private Limited, 2016. Call Number: TK2411 .B421 2016
- Gers, Juan M.; Holmes, Edward, *Protection of Electricity Distribution Networks (4th Edition)*, Institution of Engineering and Technology, 2022. [[https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kpPEDNE024/toc?b-content-type=book&b-q=relays&date\\_facets=%7B%21ex%3Dc%7Dcopyright\\_sort%3A%5B2020%20TO%202024%5D&facet\\_expanded=date&include\\_synonyms=no&q=relays&sort\\_on=default](https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kpPEDNE024/toc?b-content-type=book&b-q=relays&date_facets=%7B%21ex%3Dc%7Dcopyright_sort%3A%5B2020%20TO%202024%5D&facet_expanded=date&include_synonyms=no&q=relays&sort_on=default)]
- Austin Hughes, Bill Drury, *Electric Motors and Drives - Fundamentals, Types and Applications (5th Edition)*, Elsevier, 2019. [[https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kpEMDFTA11/toc?b-content-type=book&b-q=DC%20motors&include\\_synonyms=no&q=DC%20motors&sort\\_on=default](https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kpEMDFTA11/toc?b-content-type=book&b-q=DC%20motors&include_synonyms=no&q=DC%20motors&sort_on=default)]
- Deng, Xu; Mecrow, Barrie, *Integrated Motor Drives*, Institution of Engineering and Technology, 2022. [[https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kplMD00001/toc?b-content-type=book&b-q=electric%20machines&date\\_facets=%7B%21ex%3Dc%7Dcopyright\\_sort%3A%5B2020%20TO%202024%5D&facet\\_expanded=date&include\\_synonyms=no&q=electric%20machines&sort\\_on=default](https://app-knovel-com.ezproxy.uthm.edu.my/kn/resources/kplMD00001/toc?b-content-type=book&b-q=electric%20machines&date_facets=%7B%21ex%3Dc%7Dcopyright_sort%3A%5B2020%20TO%202024%5D&facet_expanded=date&include_synonyms=no&q=electric%20machines&sort_on=default)]
- Sivaraman Palanisamy, Sharmeela Chenniappan, A. Thaiyal Nayagi, R. Mahendran, *Basic Electrical and Instrumentation Engineering*, John Wiley & Sons, Incorporated, 2021. [<https://ebookcentral.proquest.com/lib/uthm-ebooks/detail.action?docID=6423295&query=electric%20circuit>]

### **BEV40403 High Voltage Engineering**

#### **Synopsis:**

The demand for the generation and transmission of large amount of electric power today, necessitates in transmission at extra-high voltages. At this juncture, a practising electrical engineer or a student of electrical engineering is expected to possess knowledge of techniques and should have sufficient background in high voltage engineering. This subject provides all the information on insulating materials, breakdown phenomena, overvoltages and testing techniques. Generation and measurements of various

kinds of high voltages are also introduced.

*References:*

1. Vasily Ya. Ushakov , Alexey V. Mytnikov , Ikromjon U. Rakhmonov, High-Voltage Equipment of Power Systems, Springer 2023.
2. Dale R. Patrick, Stephen W. Fardo, and Brian W. Fardo. Electrical Power Systems Technology, River Publishers, 2022, eBook ISBN: 9788770226653.
3. Zark Bedalov. Practical Power Plant Engineering : A Guide for Early Career Engineers, John Wiley & Sons, Incorporated, 2020, eBook ISBN: 9781119534983.
4. Benallou, Abdelhanine. Energy Transfers by Conduction, John Wiley & Sons, Incorporated, 2018.
5. Tapan Kumar Saha and Prithwiraj Purkait (2017), Transformer Ageing : Monitoring and Estimation Techniques, First Edition, Wiley. Call number: TK2551 .T74 2018
6. UHV Transmission Technology, edited by Electric Power Research Institute China, and Electric Power Research Institute Staff China, Elsevier Science & Technology, 2017
7. Haddad & Warne, Advance in High Voltage Engineering, IET Power and Energy Series, 2004. Call number: TK153 .A38 2004
8. M. S. Naidu & V. Kamaraju, High Voltage Engineering, McGraw-Hill, 2004. Call number: TK3001.N34 2004
9. Subir Ray, An Introduction to High Voltage Engineering, Prentice Hall India, 2004. Call number: TK153 .R39 2004
10. Dieter Kind, Kurt Feser, High Voltage Test Techniques, Oxford: Newnes, 2001. Call number: TK147 .K56 2001
11. E. Kuffel, W. S. Zaengl & J. Kuffel, High Voltage Engineering: Fundamentals, Newnes, 2000. Call number: TK153 .K83 2000

**BEV40702 Power Engineering Laboratory IV**

*Synopsis:*

The course is designed for electrical power engineering student approaching the end of their undergraduate studies. The contents of the lab instructions are designed to be open-ended in order to coach students to explore the suitable solution for various engineering problems. The contents of this course focus on various practical problems in the vital niche areas of the power system engineering such as power system stability, domestic wiring, high voltage and motor design.

*References:*

1. "SimPowerSystems: or Use with Simulink," TheMathWorks, Inc., Massachusetts, 2003.
2. R. D. Zimmerman and C. E. Murillo-Sanchez, "Matpower 5.1: User's Manual," PowerSystems Engineering Research Center (PSERC), New York, 2015.
3. P. Kundur, "PowerSystemStability and Control," McGraw- HillEducation, New York, 1994.
4. AUTOCAD 2010 Official Training Guide, Autodesk, Inc., USA, 2009
5. B. Atkinson, R. Lovegrove and G. Gundry, Electrical Installation Designs, Wiley, UK, 2013.
6. David Meeker. Finite Element Method Magnetics User's Manual Version 4.2, 2020.
7. K. B. Baltzis, "The FEMM Package: A Simple, Fast, and Accurate Open Source Electromagnetic Tool in Science and Engineering" Journal of Engineering Science and Technology Review, Vol. 1, pp. 83-89, Nov 2008.
8. G. Meunier, "The Finite Element Method for Electromagnetic Modeling", John Wiley & Sons, Jan 2010.
9. Mahboub Baccouch. Finite Element Methods and Their Applications, IntechOpen 2021, eBook ISBN 9781839623561.
10. B. Atkinson, R. Lovegrove and G. Gundry, Electrical Installation Designs, Wiley, UK, 2013.
11. D. Meeker, "Finite Element Method Magnetics Version 4.2 User's Manual", QinetiQ North America, Waltham, MA, Oct 2010.
12. K. B. Baltzis, "The FEMM Package: A Simple, Fast, and Accurate Open Source Electromagnetic Tool in Science and Engineering" Journal of Engineering Science and Technology Review, Vol. 1, pp. 83-89, Nov 2008.
13. G. Meunier, "The Finite Element Method for Electromagnetic Modeling", John Wiley & Sons, Jan 2010.
14. O.C. Zienkiewicz, R.L. Taylor, J.Z. Zhu, "The Finite Element Method: Its Basis and Fundamentals: Its Basis and Fundamentals" Butterworth-Heinemann, May 2005.
15. J. Pedro, A. Bastos, N. Sadowski, "Electromagnetic Modeling by Finite Element Methods, CRC Press, Apr 2003

**BEE32205 Industrial Training**

*Synopsis:*

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

*Pre-requisite:* Student must complete minimum 83 credits

*References:*

1. Garis Panduan Latihan Industri Pelajar (Program Sarjana Muda dan Diploma), Universiti Tun Hussein Onn Malaysia, Edisi Kelima 2021
2. Manual Pengguna Sistem Pengurusan Latihan Industri (e-LI), PTM UTHM, versi 5.0

**BEE40602 Final Year Project I**

*Synopsis:*

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

*Pre-requisite:* Student must complete minimum 95 credits

*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).

**BEE40704 Final Year Project II**

*Synopsis:*

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

*Pre-requisite:* BEE40602 Final Year Project I

*References:*

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

**BEE32603 Integrated Design Project**

*Synopsis:*

This course introduces students with the principles of integrated electrical and electronic engineering design project based on a topic selected from the courses studied or a related engineering problem. It involves teamwork, project management, engineering design, and technical presentation in a team environment. Each team is expected to address problem statement, in-depth survey, design, analysis, evaluation and revision of design towards engineering problem solution. The students also must ensure that the designed project meets specified needs with appropriate consideration for public health and safety, cultural, societal, project management, economy, and environmental.

*Pre-requisite:* Student must complete minimum 95 credits

*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:kpEAAIED01/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:kpMASAP05/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>

## SYNOPSIS OF ELECTIVE COURSES

### BEV40503 Instrumentation for Process Control

#### Synopsis:

This course provides the fundamental aspects and knowledge on the process control and its instrumentation. It is aimed at making the process more efficient by eliminating human error. Topics covered include sensors and control valves, control signal transmission, programmable logic controllers, industrial communication systems and instrumentation safety.

#### References:

1. Curtis D. Johnson, Process Control Instrumentation Technology, Pearson, 2006. Call number: TS156.8 .J63 2006.
2. William C. Dunn, Introduction to Instrumentation, Sensors and Process Control, Artech House, 2006. Call number: TS156.8 .D86 2006
3. William C. Dunn, Fundamentals of Industrial Instrumentation and Process Control, McGraw-Hill, 2005. Call number: TA156.D86 2005
4. Tony R. Kuphaldt, Lessons in Industrial Instrumentation, Creative Commons, 2012
5. Process Control Professionals, Fundamentals of Instrumentation and Process Control, Control Station, Inc., 2005.
6. Douglas O. J. Desa, Instrumentation Fundamentals for Process Control, Taylor and Francis, 2001. TP155.75 .D24 2001
7. Thomas A Hughes, Measurement and Control Basics, ISA, 2007. TS.156.8.H83 2007.

### BEV40603 Power Quality

#### Synopsis:

This subject introduces power quality (PQ) issues and problems as they relate to electric power transmission and distribution systems. This course will provide students with overall understanding of the PQ problems and how they interact with the system. In addition, possible measures to solve the PQ problems will also be discussed in this course.

*Pre-requisite:* BEV30203 Power Electronics

#### References:

1. Editor(s): P. Sanjeevikumar, C. Sharmeela, Jens Bo Holm-Nielsen, P. Sivaraman, *Power Quality in Modern Power Systems*, Academic Press, 2021, ISBN 9780128233467, <https://doi.org/10.1016/B978-0-12-823346-7.05001-5>. (<https://www.sciencedirect.com/science/article/pii/B9780128233467050015>)
2. Santoso, Surya, Mark F. McGranaghan, Roger C. Dugan, and H. Wayne Beaty. 2012. *Electrical Power Systems Quality*. 3rd ed. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071761550>
3. C. Sankaran, *Power Quality*, CRC Press, 2002.
4. Kusko, Alexander. 2007. *Power Quality in Electrical Systems*. 1st ed. New York: McGraw-Hill. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9780071470759>.
5. Bhim Singh, Ambrish Chandra, Kamal Al-Haddad, *Power Quality "Problems and Mitigation Techniques"*, Wiley, 2015.
6. Ewald F. Fuchs, Mohammad A.S. Masoum, *Power Quality in Power Systems, Electrical Machines, and Power-Electronic Drives (Third Edition)*, Academic Press, 2023, ISBN 9780128178560, <https://doi.org/10.1016/B978-0-12-817856-0.09988-X>. (<https://www.sciencedirect.com/science/article/pii/B978012817856009988X>)

### BEE41403 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:*

1Haifeng Dai and Jiangong, Advances in Lithium-Ion Batteries for Electric Vehicles, 2024 Elsevier (<https://doi.org/10.1016/C2022-0-01751-7>)

Per Enge, Nick Enge and Stephen Zoepf, Electric Vehicle Engineering, 1st Edition, 2021 McGraw Hill. (<https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260464078/chapter/chapter6#/c9781260464078ch06lev1sec03>)

Sivaraman Palanisamy, Sharmeela Chenniappan, Sanjeevikumar Padnmanaban, Fast Charging Infrastructure for Electric and Hybrid Electric Vehicles: Methods for Large Scale Penetration into Electric Distribution Networks, John Wiley & Son, 2023 (Call number: TL221.15 .P34 2023)

Xi Zhang, Chong Zhu, Haito Song, Wireless Power Transfer Technologies for Electric Vehicles, Huazhong University of Science and Technology Press, 2022 (Call number: TK3091 .X59 2022)

Francis M. Vanek, Louis D. Albright, Largus T. Angenent, Michael W. Ellis, D.David A. Dillard, Energy Systems Engineering: Evaluation and Implementation, 4th Edition, 2022 McGraw Hill, (<https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260456400/toc-chapter/chapter15/section/section15>)

**BEV41003                      Railway Power System Engineering**

*Synopsis:*

This course provides an in-depth understanding of railway power systems, including Introduction of Railway Power Systems. DC and AC Electric Traction Systems, Signal Compatibility with AC Railway Electrification Systems, Traction Systems and Future Trends and Sustainability of Railways. This course also will cover on power generation, transmission, distribution, and integration of renewable energy sources. This field is essential for ensuring efficient, reliable, and safe operation of electrified railways

*References:*

"1. Morris Brenna, Federica Foadelli, Dario Zanileli, ""Electrical Railway Transportation Systems"", Wiley, 2018                      2. Ponnuswamy, S., Railway Transportation: Engineering, Operation and Management, Oxford: Alpha Science International, 2012. Call No.: TF145 .P66 2012

3. Laughton, M.A. Warne, D.F.. (2003).Electrical Engineer's Reference Book (16th Edition). Elsevier. Retrieved from

<https://app.knovel.com/hotlink/toc/id:kpEERBE001/electrical-engineers/electrical-engineers>

4. Kumar, Nayan Guerrero, Josep M. Kasta, Debaprasad, Saha, Tapas Kumar. (2022). Power Electronics for Next-Generation Drives and Energy Systems, Volume 1 - Converters and Control for Drives. Institution of Engineering and Technology (The IET). Retrieved from

<https://app.knovel.com/hotlink/toc/id:kpPENGDES5/power-electronics-next/power-electronics-next>

5. Moses, Anthony Anderson, Philip Jenkins, Keith Stanbury, Hugh. (2019). Electrical Steels, Volume 2 - Performance and Applications. Institution of Engineering and Technology (The IET). Retrieved from <https://app.knovel.com/hotlink/toc/id:kpESVPA002/electrical-steels-volume/electrical-steels-volume.>"

**BEV40903                      Energy Management and Efficiency**

*Synopsis:*

This course provides a comprehensive understanding of energy management practices and strategies aimed at optimizing energy consumption and improving efficiency. It covers the fundamentals of energy systems, types of energy, and the importance of energy efficiency in reducing costs and environmental impact. Students will learn on energy audits, analyze energy performance, and implement energy-saving measures. Energy policies, regulation and act such as efficient management of electrical energy regulation (EMEER) 2008 will also be covered in this course.

*References:*

"1. Energy Conservation Guidebook (4th Edition), Patrick, Dale R.; Fardo, Stephen W.; Richardson, Ray E.; Fardo, Brian W.; Barron, Mark, 2023

2. Unlocking Energy Efficiency: Maximizing Utility Savings with Zero Equipment Investment, Roger

Brown, River Publishers, 2023

3. 5 Effective Energy Management Amid the 4th Industrial Revolution, Diaa-Eldin A. Mansour et. al., River Publishers, 2024
4. Management, Measurement and Verification of Performance Contracting, James P. Waltz, 2003.
5. Gilbert M.Masters, Renewable and Efficient Electric Power Systems, Wiley, 2005. (TK1005 .M37 2004)
6. Measurement and Verification Course Material, Malaysia Green Technology Corporation (MGTC), 2016.
7. Energy Efficiency and Conservation Guidelines For Malaysian Industries, Part 1: Electrical Energy-Use Equipment, Suruhanjaya Tenaga (St), Second Edition, 2008.
8. Electrical Energy Audit Guidelines for Building, Part 1, Suruhanjaya Tenaga, 2016"

### **BEE41503      Photovoltaic Systems**

#### *Synopsis:*

The course has been designed to introduce the technology of solar photovoltaic engineering and grid-connected photovoltaic (GCPV) system 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. Fundamentals of Solar Cells and Photovoltaic Systems Engineering. <https://www-sciencedirect-com.ezproxy.uthm.edu.my/book/9780323961059/fundamentals-of-solar-cells-and-photovoltaic-systems-engineering#book-info>. 2024.
2. Photovoltaic Solar Energy Conversion - Technologies, Applications and Environmental Impacts. <https://www-sciencedirect-com.ezproxy.uthm.edu.my/book/9780128196106/photovoltaic-solar-energy-conversion>. 2020.
3. Advances in Grid-Connected Photovoltaic Power Conversion Systems. <https://www-sciencedirect-com.ezproxy.uthm.edu.my/book/9780081023396/advances-in-grid-connected-photovoltaic-power-conversion-systems>. 2019.
4. Fundamentals and Applications of Renewable Energy. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781265079659/toc-chapter/chapter3/section/section10>. 2023.

### **BEE41103      HCIA Routing and Switching**

#### *Synopsis:*

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

#### *References:*

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

### **BEE41203      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 technologist.

*References:*

1. Huawei Technologies Co. Ltd, HCNA Networking Study Guide, Springer, 2016
2. Jiongjong 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.

**BEE41303                    HCIA Artificial Intelligence**

*Synopsis:*

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

*References:*

1. Huawei Technologies Co. Ltd, HCNA Networking Study Guide, Springer, 2016
2. Xiaoyao Liang, Ascend AI Processor Architecture and Programming: Principles and Applications of CANN, 2020
3. Zhiyuan Chen, Bing Liu, Lifelong Machine Learning: Second Edition, 2018
4. Mahrishi, Mehul, et al., editors. Machine Learning and Deep Learning in Real-Time Applications. IGI Global, 2020. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-7998-3095-5>
5. Baby Maruthi, Puvvadi, et al., editors. Machine Learning Algorithms Using Scikit and TensorFlow Environments. IGI Global, 2024. <https://doi-org.ezproxy.uthm.edu.my/10.4018/978-1-6684-8531-6>

**EEF40103                    Introduction to Big Data**

*Synopsis:*

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

*References:*

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

5. Voss, Jochen An introduction to statistical computing: a simulation-based approach, Chichester, West Sussex: Wiley 2014 Call Number: QA276.4. V67 2014

#### **EIF40103            Machine Learning**

##### *Synopsis:*

An introduction to machine learning theories and algorithms. Topics include supervised Learning (artificial neural networks, support vector machines) and unsupervised learning (clustering, dimensionality reduction).

##### *References:*

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

#### **EWF40103            Data Science and Applications**

##### *Synopsis:*

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

##### *References:*

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

#### **EWF40203            Data Visualisation**

##### *Synopsis:*

Data visualisation is the graphical representation of information using visual elements like charts, graphs, maps, dashboard and etc. Data visualisation tools such as Tableau and Microsoft Power BI provides an

accessible way to see and understand trends, outliers, forecast and patterns in data.

*References:*

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

**EEF40203            Energy Literacy**

*Synopsis:*

This course offers a comprehensive exploration of energy literacy, focusing on key topics that will equip students with essential knowledge and skills for understanding and managing energy in a sustainable way. The course covers a wide range of topics from the basics of energy systems to the latest developments in renewable energy and energy management. Students will be encouraged to take an active role in managing energy in their daily lives and share this knowledge with others, becoming energy-literate consumers.

*References:*

1. Patrik Thollander, Magnus Karlsson, Patrik Rohdin, Johan Wollin, Jakob Rosenqvist, Introduction to Industrial Energy Efficiency, Academic Press, 2020, "Introduction to Industrial Energy Efficiency Energy Auditing, Energy Management, and Policy Issues". <https://www.sciencedirect-com.ezproxy.uthm.edu.my/book/9780128172476/introduction-to-industrial-energy-efficiency#book-info>
2. Mirjana Radovanović, Sustainable Energy Management - Planning, Implementation, Control, and Security (Second Edition), Academic Press, 2023, <https://www.sciencedirect-com.ezproxy.uthm.edu.my/book/9780128210864/sustainable-energy-management>
3. Mirjana Golušin, Siniša Dodić, Stevan Popov, Sustainable Energy Management, Academic Press, 2013, <https://www.sciencedirect-com.ezproxy.uthm.edu.my/book/9780124159785/sustainable-energy-management>
4. Kanoğlu, Mehmet, Yunus A. Çengel, and John M. Cimbala. 2023. Fundamentals and Applications of Renewable Energy. 2nd ed. New York: McGraw Hill. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781265079659>
5. Kanoğlu, Mehmet, and Yunus A. Çengel. 2020. Energy Efficiency and Management for Engineers. 1st ed. New York: McGraw-Hill Education. <https://www-accessengineeringlibrary-com.ezproxy.uthm.edu.my/content/book/9781260459098>

**UQU40103            Professional@Work**

*Synopsis:*

This course helps students develop technical skills in professionalism, social responsibility, and environmental sustainability. The course covers professional practice, ethics, law, innovation, social responsibility, and the work environment. It is based on Sustainable Development Goals (SDGs) and PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) guidelines. Students will also implement a community service project addressing local issues that promote professional practices.

*References:*

1. Lydia E. Anderson & Sandra B. Bolt (2016). Professionalism : skills for workplace success. Pearson,

c2013 ISBN 9780132624664

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

## SYNOPSIS OF MASTER INTEGRATION COURSES

### **MEE10103      Advanced Engineering Mathematics**

#### *Synopsis:*

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

#### *References:*

1. Tay, K. G, Kek, S. L & Abdul Kahar, R. (2013). Numerical Methods with Excel. Penerbit UTHM, Batu Pahat.
2. Tay, K.G. & Abdul Kahar, R. (2011). Advanced Engineering Mathematics. 3rd Edition. Penerbit UTHM, Batu Pahat.
3. Tay, K. G, Kek, S. L & Abdul Kahar, R. (2011). Numerical Methods with Casio ES PLUS 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.

### **MEE10203      Programmable Electronics**

#### *Synopsis:*

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

#### *References:*

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

### **MEE10303      Advanced Digital Signal 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. Schaffer, 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.MEE10403 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. Schaffer, 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 House 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.

## MEE10603 Advanced Power Electronics

### *Synopsis:*

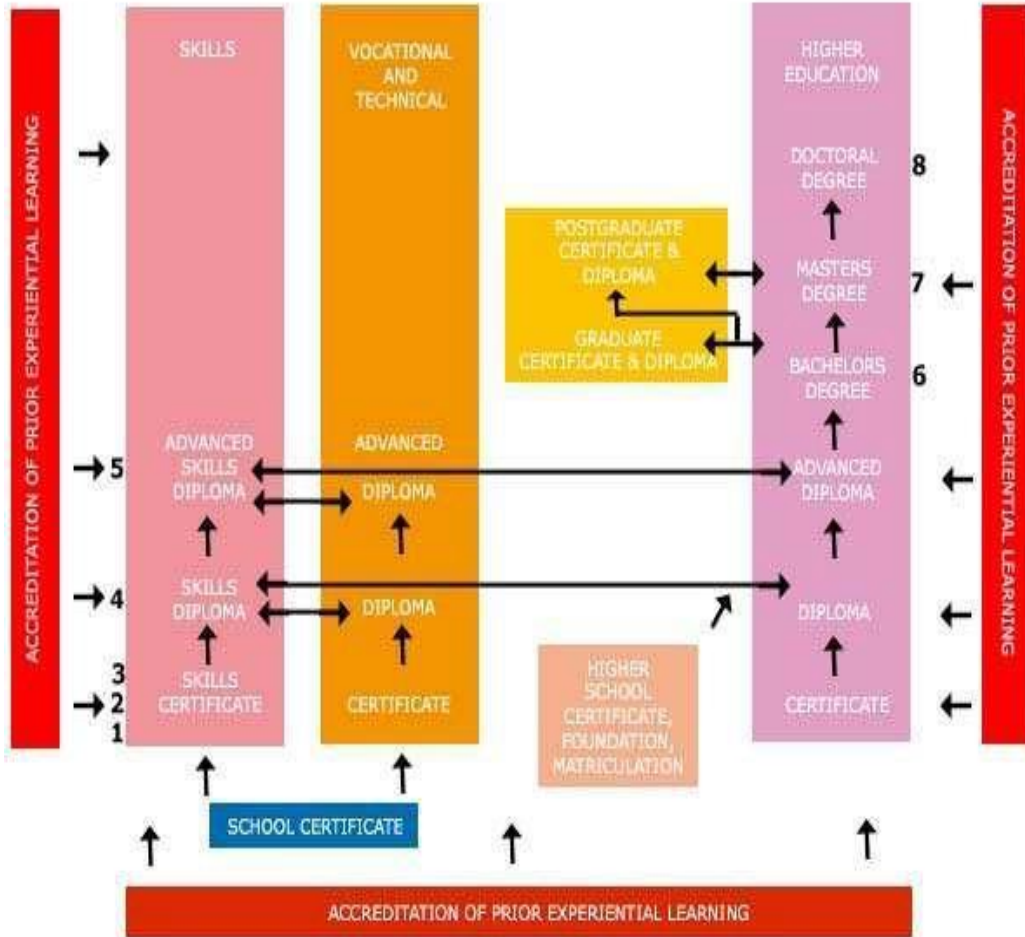
This subject will discuss a review of electrical fundamentals of power electronics devices concepts of PWM modulation techniques apply in power semiconductor switches. The student also will be discussed in details about Diode Rectifiers, Thyristor-Based Rectifiers, DC to DC Converters, DC to AC Converters,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

### *References:*

1. Mohan Ned, Undeland Tore M and Robbin William P, Power Electronics: Converters, Applications and Design, 3rd Edition, John Wiley, 2003. [TK7881.15 .M63 2003]
2. Rashid M.H, Power Electronics, Circuits, Devices and Applications, 3rd Edition, Prentice-Hall, 2004. [TK7881.15 .M5 2004]
3. Rashid M.H, SPICE for power electronics and electric power, 2nd Edition, Boca 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 Wiley, 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]
7. 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.

## Further Education Pathway (Source from Malaysian Qualification Framework)

**MQF BASED ON QUALIFICATION LEVEL AND EDUCATIONAL PATHWAY**



**MALAYSIAN QUALIFICATIONS FRAMEWORK:  
QUALIFICATIONS AND LEVELS**

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

**Disclaimer:**

This is a revised Faculty of Electrical and Electronic Engineering Proforma  
Bachelor of Electrical Engineering with Honours as of 1<sup>st</sup> September 2024  
FKEE



**Centre for Academic Development and Training  
Universiti Tun Hussein Onn Malaysia  
86400 Batu Pahat, Johor Darul Ta'zim  
[www.uthm.edu.my](http://www.uthm.edu.my)**