ACADEMIC PROFORMA

2021/2022

UTHM
Universiti Tun Hussein Onn Malaysia

BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS

QS STARS™ RATING SYSTEM

Universiti Tun Hussein Onn Malaysia
Is Rated as a Five-Star Institution

QS STARS™ RATING SYSTEM Teaching

QS STARS™ RATING SYSTEM Employability

QS STARS™ RATING SYSTEM Innovation

QS STARS™ RATING SYSTEM Online Learning

QS STARS™ RATING SYSTEM Inclusiveness

UTHM Produces Professionals

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING
Universiti Tun Hussein Onn Malaysia
86400, Parit Raja, Batu Pahat, Johor

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Centre for Academic Development and Training
Universiti Tun Hussein Onn Malaysia
September 2021

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Foreword by The Vice Chancellor

Assalammualaikum Warahmatullahi Wabarakatuh and greetings.

I would like to congratulate and welcome all students who will embark on the next important chapter of your life here at UTHM. We appreciate your trust for choosing to be with UTHM in continuing your endeavor for success in your life.

The Coronavirus Disease 2019 (Covid-19) has continue to deny new and current students the opportunity to experience higher education environment one would dream. The innovation of vaccines has given us the ray of hope that would eventually allow us to do what we do best, i.e. educating the young and bright Malaysians like you.

I would like to highlight that UTHM has set four main pillars in order become a global technoprenuer university. They are Edu-Train, Technopreneur, UTHM Prihatin and Governance. At the heart of these pillars are the students and staffs who will be the driving force for success. As a new student to this university, it is my hope that you will participate and contribute to the mission of the university.

Nevertheless, UTHM will continue to strive in providing the best learning experience available. Academic programmes are continuously reviewed to ensure that the most recent educational initiatives are implemented. This is in line with the aspirations of the Ministry of Higher Education Malaysia in transforming learning and teaching process to be more flexible, organic, dynamic and effective. Additionally, initiatives such as High Impact Educational Practices (HIEPs), Future Ready Curriculum (FRC), Entrepreneurship Integrated Education (EIE) will take centre stage and shape the academic curriculum, which will increase the Graduate Employability (GE). These initiatives, coupled with dedicated academics and world class facilities will produce holistic graduates and later professionals, as promised in our tagline, ‘UTHM Produces Professional”.

On a final note, I would like to again welcome all students to our big family. I believe that you will become successful university graduates and will continue the university tradition of academic excellence. I am also confident that you will be able to apply knowledge and skills gained for the benefit of the society.

Best wishes.

Y. BHG. PROFESSOR DATUK TS. DR. WAHID BIN RAZZALY
Vice Chancellor
Universiti Tun Hussein Onn Malaysia

Foreword by The Deputy Vice Chancellor (Academic and International)

Assalammualaikum Warahmatullahi Wabarakatuh and greetings.

I would like to take this opportunity to congratulate and welcome all new students of the academic session 2021/2022 to Universiti Tun Hussein Onn Malaysia (UTHM). Similarly, my congratulations to the Centre for Academic Development and Training for successfully publishing this proforma in which can become a guide for the students to plan their learning journey at the university.

As everyone is aware, the Covid-19 pandemic has continued to change Malaysia's higher education landscape. All universities must adjust to the new norm which affects the learning and teaching process. Students and lecturers are left with no other options than to continue with online classes. Thus, UTHM will continue to ensure quality education through innovative delivery and world class facilities so that no student will be left behind.

Apart from the above, the higher education in Malaysia has evolved from teacher-centered to student-centered learning. In addition, much initiatives have been rolled out towards the development of holistic and balanced graduates in terms of ethic, moral, knowledge, and skills. In order to improve the quality of learning and teaching, Industry Revolution 4.0 and work-based learning elements are embedded into the curriculum to ensure that academic programmes offered by UTHM continue to be relevant to the needs of current industry and market. Apart from that, knowledge and experience sharing between the key players of local and foreign industries in relation to industries and students as well as local community are delivered through CEO@Faculty programs.

UTHM with much effort and dedication will strive to become the champion of TVET. The existing academic programmes are aligned towards producing excellent TVET graduates. New programmes are developed to cater for new areas in TVET, which are seen to be the dominant workforce in Malaysia. It is hoped that all these efforts will further accelerate UTHM in becoming a global technopreneur university.

I do hope that all the initiatives which have been and will be rolled out by UTHM will give you valuable experiences in exploring knowledge and skills at UTHM. I would like to call out on you to take the opportunity to explore your own potential through various co-curricular activities and programmes prepared by UTHM. To achieve these aspirations, early preparations guided by this proforma will help you plan for your journey throughout your studies at UTHM. I hope you will be able to achieve excellent academic results and outstanding success.

Finally, I wish you all the best and pray that you will be successful in your studies at the university and be able to contribute to the development of the religion, race and nation.

"WITH WISDOM WE EXPLORE"

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

Foreword by The Dean

Assalamualaikum Warahmatullahi Wabarakatuh and Greetings.

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

FKEE UTHM is one of the best equipped engineering faculties with excellent teaching and research facilities. Currently, it is a home for over 2000 undergraduates, postgraduates and research students which hails from all over Malaysia and other countries.

The teaching and learning in the Faculty are supported by 149 academic staff, 40 assistant engineers and 13 administrative staff. On top of that, our academic programmes are accredited by Malaysian Qualifications Agency (MQA) and Engineering Acreditation Council (EAC).

Everyone involved with FKEE is united by a common desire to make the world a better place by emphasising the philosophy of “to learn and improve” as well as “giving is the best communication”. In this Faculty, it is not simply about electrical and electronic engineering, it is about being a holistic person which will bring more benefit to the mankind.

This booklet highlights important information on Bachelor of Electronic Engineering with Honours programme (BEJ) and courses to be enrolled throughout your study in FKEE. Remember, success is a journey, not a destination. In this journey, you will be surrounded by a conducive, positive and exciting environment as a whole.

To enhance your experience, our modern laboratories should also be utilised to strengthen practical and hands-on skills and demonstrate concepts and theories.

In brief, this is your journey, your opportunity. Give your very best swing and appreciate your learning curve with us.

On behalf of FKEE, I wish you every success!

FKEE – Fokus, Kualiti, Endah, Etika

ASSOC. PROF. DR. ROSLI BIN OMAR
Dean
Faculty of Electrical and Electronic Engineering
Universiti Tun Hussein Onn Malaysia

Vision

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

Mission

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

Education Philosophy of University

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

Logo of University

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

Symbolism:

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

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

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

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

Chancellor

Duli Yang Maha Mulia Sultan Ibrahim Ibni Almarhum Sultan Iskandar
Sultan Yang Dipertuan Bagi Negeri Dan Jajahan Takluk Johor Darul Ta'zim
D.K., D.K.(Pahang), SPMJ, SSIJ,S.M.N.,S.P.M.T., S.M.P.K., P.I.S.

Pro-Chancellor I

Duli Yang Amat Mulia Tunku Ismail Ibni Sultan Ibrahim
Tunku Mahkota of Johor (TMJ)
D.K., SPMJ, P.I.S

Pro-Chancellor II

YBhg. Tan Sri Dr. Ali Hamsa

BOARD OF DIRECTORS OF UNIVERSITY

Chairman

YBhg. Dato' Sri Ibrahim bin Ahmad

Members

YBhg. Prof. Datuk Ts. Dr. Wahid bin Razzaly
Vice Chancellor, Universiti Tun Hussein Onn Malaysia

YB. Dato' (Dr.) Haji Nooh bin Gadot
Advisor, Majlis Agama Islam Johor

YBhg. Datuk Ts. Pang Chau Leong
Member, Board of Directors

YBhg. Dato' Dr. Mohd. Padzil bin Hashim
Putra Business School, Universiti Putra Malaysia

YBhg. Dato' Ir. Dr. Haji Abdul Rashid bin Maidin
Managing Director, Pusat Bertauliah Akademik Profesional Koperasi Serbaguna Anak-anak Selangor Berhad (KOSAS)

YBrs. Mr. Ahmad Luqman bin Mohd. Azmi
Chief Operations Officer, Malaysia Airlines Berhad

YBrs. Dr. Sharifah Adlina binti Syed Abdullah
Ministry of Finance Malaysia

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

YBrs. Ts. Zainab binti Ahmad
Chief Director, Jabatan Pendidikan Politeknik dan Kolej Komuniti, Kementerian Pengajian Tinggi

YBrs. Prof. Dr. Yusri bin Yusof
Professor, Universiti Tun Hussein Onn Malaysia

YBrs. Puan Elain Lockman
Chief Executive Officer and Co-Founder, Ata Plus Sdn. Bhd.

Alternate Member

YBrs. Ts. Haji Mohamad Amin bin Hamat
Deputy Chief Director, Ministry of Higher Education

Secretary

YBrs. Mr. Abdul Halim bin Abdul Rahman
Registrar, Universiti Tun Hussein Onn Malaysia

MEMBERS OF SENATE

Chairman

YBhg. Prof. Ts. Dr. Wahid bin Razzaly
Vice Chancellor

Members

Prof. Dr. Azme bin Khamis
Deputy Vice Chancellor (Academic and International)

Prof. Dr. Mohd Shahir Shamsir Bin Omar
Deputy Vice Chancellor (Research and Innovation)

Assoc. Prof. Ts. Dr. Lokman Hakim bin Ismail
Deputy Vice Chancellor (Student Affairs and Alumni)

Assoc. Prof. Dr. Mohd Kamarulzaki bin Mustafa
Provost UTHM Pagoh Campus

Prof. Dr. Ahmad Tarmizi bin Abd Karim
Assistant Vice Chancellor (Strategic Planning and Corporate Relations)

Assoc. Prof. Dr. Mas Fawzi bin Mohd Ali
Assistant Vice Chancellor (Financial Sustainability)

Prof. Dr. Shahruddin bin Mahzan @ Mohd Zin
Dean, Centre for Graduate Studies

Assoc. Prof. Ir. Ts. Dr. Mohd Irwan bin Juki
Dean, Faculty of Civil Engineering and Built Environment

Assoc. Prof. Dr. Rosli bin Omar
Dean, Faculty of Electrical and Electronic Engineering

Assoc. Prof. Ir. Ts. Dr. Bukhari bin Manshor
Dean, Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Wan Fauzi@Fauziah binti Wan Yusoff
Dean, Faculty of Technology Management and Business

Assoc. Prof. Ts. Dr. Abdul Rasid bin Abdul Razzaq
Dean, Faculty of Technical and Vocational Education

Ts. Dr. Azizul Azhar bin Ramli
Dean, Faculty of Computer Science and Information Technology

Prof. Dr. Hashim bin Saim
Dean, Faculty of Applied Science and Technology

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

Assoc. Prof. Dr. Mohamad Zaky bin Noh
Dean, Centre for Diploma Studies

Assoc. Prof. Dr. Khairul Azman bin Mohamad Suhaimy
Dean, Centre for General Studies and Co-curricular

Assoc. Prof. Dr. Zailin Shah binti Yusoff
Dean, Centre for Language Studies

Prof. Dr. Erween bin Abdul Rahim
Director, Centre for Academic Development and Training

Assoc. Prof. Ts. Dr. Razali bin Hassan
Director, Malaysia Research Institute for Vocational Education and Training

Prof. Ts. Dr. Abd Halid bin Abdullah
Faculty of Civil Engineering and Built Environment

Prof. Dr. Noridah binti Mohamad
Faculty of Civil Engineering and Built Environment

Prof. Dr. Mohammad Faiz Liew bin Abdullah
Faculty of Electrical and Electronic Engineering

Prof. Ir. Dr. Md Saidin bin Wahab
Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Yusri bin Yusof
Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Abdul Talib bin Bon
Faculty of Technology Management and Business

Prof. Dr. Rosziati binti Ibrahim
Faculty of Computer Science and Information Technology

Prof. Dr. Nazri bin Mohd Nawi
Faculty of Computer Science and Information Technology

Prof. Dr. Rozaini bin Roslan
Faculty of Applied Science and Technology

Assoc. Prof. Ts. Dr. Mohd. Farhan bin Md. Fudzee
Director, Information Technology Centre

Ir. Ts. Dr. Raha binti Abd Rahman
Industry Fellow

Mr. Abdul Halim bin Abdul Rahman
Registrar / Secretary of Senate

Mr. Norzaimi bin Hamisan
Bursar

Mdm. Zaharah binti Abd Samad
Acting Chief Librarian

Mdm. Norliah binti Yaakub
Head of Legal Unit

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING

Vision

"To be a leading centre of excellence in the generation and application of electrical and electronic engineering knowledge"

Mission

"To produce dynamic, creative and ethical graduates who will lead in the application of electrical and electronic engineering for the prosperity of humankind"

Quality Objectives

1. To implement academic programmes at undergraduate and postgraduate level in electrical and electronic engineering recognized by relevant accreditation bodies

2. To produce at least 10% of undergraduate graduates with a CPA of ≥ 3.50 and 4% of first class honours graduates in a year

3. To ensure the graduates employability reaches at least 70% after 6 months of graduation

4. To ensure 75% of the academic staff have a Doctorate (Ph.D) degree

5. To produce at least 6 publications in average per academic staff in the form of conference papers / journal articles / proceedings / modules / original books / translation books / other related scholarly articles in one year

6. To ensure that at least 80% of the academic staff are involved in research or consultation during the current year

7. To ensure that at least 90% of the staff meet the 7-day training and development program a year

FACULTY BACKGROUND

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

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

The Faculty also has one Centre of Reseach (CoR) known as Advanced Telecommunication Research Center (ATRC). 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)

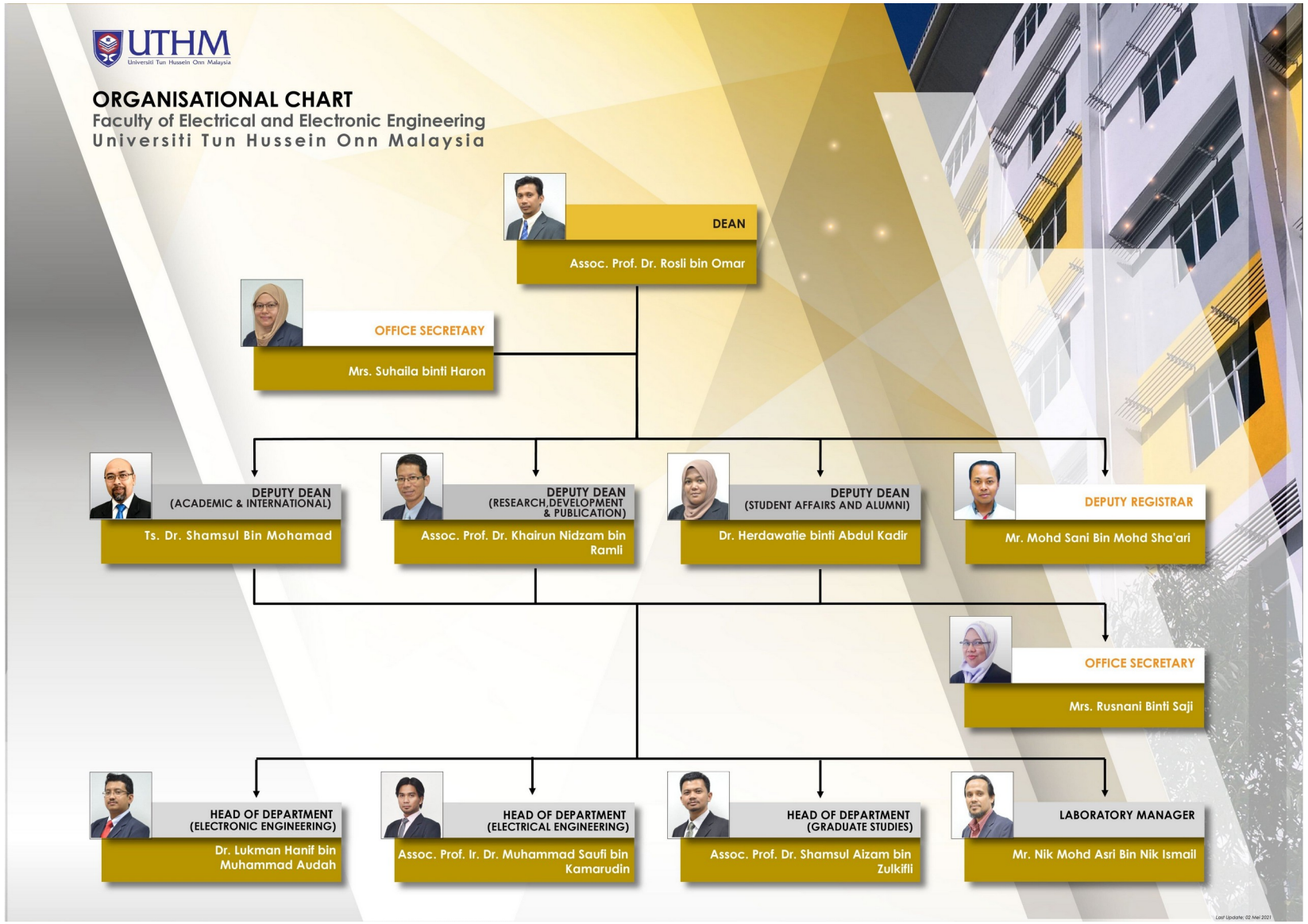
Currently, there are various focus groups that play pivotal role towards research culture establishment in FKEE. The list includes the following:

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)

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

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

ORGANIZATIONAL CHART



EXTERNAL VISITORS

Adjunct Professor

Dr. Ahmad Kamsani Bin Samingan
TM Innovation Centre

Visiting Professor

Prof. Ir. Dr. Ismail bin Musirin
Universiti Teknologi MARA (UiTM)

External Examiner

Prof. Ir. Dr. Wong Hin Yong
Universiti Multimedia (MMU)

Industrial Advisory Panel

Ir. Azizi bin Ahmad
Petrofac RNZ

Mr. Tan Chan Lik
Infineon Technologies (Kulim) Sdn. Bhd.

Mr. Kenneth Wong Fatt Kong
Iconix Systems and Solutions Sdn. Bhd.

Dr. Mazlan bin Abbas
FAVORIOT Sdn Bhd.

En. Redzuan Shah bin Yusoff
Telekom Malaysia Berhad

Ir. Shamila Ariaratnam
Armamentarium Consulting

STAFF DIRECTORY

Administration

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

Deputy Dean (Academic and International)
Ts. Dr. Shamsul bin Mohamad
PhD (Computer Science) (UTM)
MSc (Computer Science) (USM)
BSc (Computer Science) (UTM)

Deputy Dean (Research, Development and Publication)
Associate Professor Dr. Khairun Nidzam bin Ramli
PhD (Computational Electromagnetics) (Univ. of Bradford)
MEng (Communication & Computer Engineering) (UKM)
BEng (Electronic Engineering) (UMIST)

Deputy Dean (Student Affairs and Alumni)
Dr. Herdawatie binti Abdul Kadir
PhD (Control and Robotic) (USM)
MEng (Electrical - Mechatronic) (UTM)
BEng (Electrical) (UTM)

Head, Department of Electronic Engineering
Dr. Lukman Hanif bin Muhammad Audah
PhD (Electronic Engineering) (University of Surrey)
MSc (Communication Network & Software) (University of Surrey)
BEng (Electrical - Telecommunication) (UTM)

Head, Department of Electrical Engineering
Associate Professor Ir. Dr. Muhamamd Saufi bin Kamarudin
PhD (Electrical Engineering) (Cardiff University)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

Head, Department of Postgraduate Studies
Associate Professor Dr. Shamsul Aizam bin Zulkifli
PhD (Electrical Engineering) (Loughborough University)
MEng (Electrical Power) (UPM)
BEng (Electrical & Electronics) (UPM)

Laboratory Manager
Mr. Nik Mohd Asri bin Nik Ismail
MEng (Electrical Engineering) (UTHM)
BEng (Hons.) (Electrical & Electronic) (UiTM)

Deputy Registrar
Mr. Mohd Sani Bin Mohd Sha'ari
Bachelor of Public Administration (UUM)
Diploma in Public Administration (ITM)

Office Secretary
Mdm. Suhaila binti Haron
Dip. Secretarial Science (ITM)

Office Secretary
Mdm. Rusnani binti Saji
Dip. Secretarial Science (POLISAS)

Senior Assistant Administrative Officer
Mr. Hashim bin Hamdan
Sijil Pelajaran Malaysia (SPM)

Senior Administrative Assistant
Mdm. Saemah binti Ariffin
Sijil Pelajaran Malaysia (SPM)

Senior Assistant Administrative Officer
Mr. Sahdan bin Ahmad @ Mohammad
Diploma in Estate Management (UiTM)

Assistant Administrative Officer
Ms. Nurulhuda binti Md Sharif
Bachelor in Business Administration (UM)
Dip. Business (Management) (Poli. Ungku Omar)

Assistant Administrative Officer
Mr. Azizam bin Mohd Khairan
Dip. Business Studies (Poli. Shah Alam)

Administrative Assistant
Ms. Nur Shahila binti Salim
Bachelor in Office Systems Management (UiTM)

Administrative Assistant
Mdm. Nurul Nadia binti Ghadzali
Dip. (Wood Based Technology) (Poli. Shah Alam)

Administrative Assistant
Mdm. Siti Hajar binti Sulaiman
Cert. Information Technology (Poli Johor Bahru)

Administrative Assistant
Mr. Muhammad Ariff bin Md Ngadiran
Dip. Information Technology (Kolej Poly-Tech MARA)

Operational Assistant
Mr. Abdul Rahman Adrin bin Mahat
Lower Certificate of Education

Department of Electronic Engineering (JKEN)

Head of Department
Dr. Lukman Hanif bin Muhammad Audah
PhD (Electronic Engineering) (University of Surrey)
MSc (Communication Network & Software) (University of Surrey)
BEng (Electrical - Telecommunication) (UTM)

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

Professor Dr. Jiwa bin Abdullah
PhD (Electrical and Electronic Engineering) (Loughborough University)
MSc (Digital Communication System) (Loughborough University)
BEng (Electrical and Electronic Engineering) (University of Liverpool)

Associate Professor Dr. Fauziahanim binti Che Seman
PhD (Electrical Engineering) (Queen's University of Belfast)
MEng (Electrical - Communication) (KUiTTHO)
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. Muhammad Yusof bin Ismail
PhD (Antenna and Microwave Propagation) (Queen's University of Belfast)
BEng (Electrical) (UKM)

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. Noorsaliza binti Abdullah
PhD (Communication Engineering) (Shizuoka University)
MEng (Electrical - Electronics and Telecommunications) (UTM)
BEng (Electrical) (UTM)

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PhD (Electronic & Telecommunication) (University of Bradford)
MSc (Communication and Networking) (University of Loughborough)
BEng (Electrical) (UM)

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. Tay Kim Gaik
PhD (Mathematics) (UTM)
Master (Mathematics) (UTM)
Bachelor (Mathematics) (UTM)

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)

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

Dr. Lukman Hanif bin Muhammad Audah
PhD (Electronic Engineering) (University of Surrey)
MSc (Communication Network & Software) (University of Surrey)
BEng (Electrical - Telecommunication) (UTM)

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

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

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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) (KUiTTHO)

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 & Communcation) (UKM)
BEng (Electrical) (UTM)

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MEng (Electrical - Electronics, and Telecommunications) (UTM)
BEng (Electrical-Telecommunications) (UTM)

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PhD (Electrical Engineering) (UTHM)
MEng (Electrical & Electronic) (Nanyang Technology University)
BEng (Electrical) (KUiTTHO)

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

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

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

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

Mdm. Elfarizanis binti Baharudin
MEng (Commmunication and Computer) (UKM)
BEng (Electrical) (UiTM)

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

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

Specialisation Area: Computer Engineering (BEC)

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

Associate Professor Dr. Afandi bin Ahmad
PhD (Electronics & Computer Engineering) (Brunel University)
MSc (Microelectronic) (UKM)
BEng (Electrical) (KUiTTHO)

Associate Professor Dr. Muhammad Ramlee bin Kamarudin
PhD (Electrical Engineering) (University of Birmingham, UK)
MSc (Communications Engineering) (University of Birmingham, UK)
BEng (Electrical-Telecommunications) (UTM)

Associate Professor Dr. Siti Zarina binti Mohd. Muji
PhD (Electrical Engineering - Electronic Instrumentation) (UTM)
MSc (Electrical & Electronics - Data communication) (USM)
BEng (Electrical & Electronics - Computer) (USM)

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

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

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

Dr. Danial bin Md. Nor
PhD (Electrical Engineering) (UTHM)
Docteur en Informatique de l'Université de La Rochelle
MSc (Information Technology) (USM)
BTech (Electrical Eng) with Ed. (UTM)

Ts. Dr. Khalid bin Isa
PhD (Computational Intelligence) (USM)
MSc (Computer and System Engineering) (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) (KUiTTHO)

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

Ts. Dr. Nan bin Mad Sahar
PhD (Advanced System Engineering) (Okayama University)
MEng (System & Communication Engineering) (Okayama University of science)
BEng (Information & Computer Engineering) (Okayama University of science)

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

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

Ir. Ts. Dr. Norfaiza binti Fuad
PhD (Electrical Engineering) (UiTM)
MSc (Computer and System Engineering) (UPM)
BEng (Computer Engineering) (UTM)

Dr. Radzi bin Ambar
PhD (Mechanical and Control Engineering) (Kyushu Institute of Technology)
MEng (Electrical) (UTHM)
BEng (Information and Computer Science 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 Engineering) (UKM)
BEng (h) Electronic Engineering (KUiTTHO)

Dr. Siti Idzura binti Yusuf
PhD (Computer and Communication System) (UPM)
MEng (Electrical Engineering) (KUiTTHO)
MEdu (Technical & Vocational Education) (KUiTTHO)
BEng (Electrical) (KUiTTHO)

Mr. Hazwaj bin Mhd. Poad
MEng (Computer Science & Intelligent System) (Oita University)
BEng (Computer Science & Intelligent System) (Oita University)

Mr. Mohd. Helmy bin Abd Wahab
Msc (Intelligent System) (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) (Honours)(USM)

Mdm. Zarina binti Tukiran
MEng (Communication & Computer Engineering) (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 Dr. Wan Nurshazwani binti Wan Zakaria
PhD (Mechanical & System Engineering – Medical Robotics) (Newcastle University)
MSc (Mechatronics) (Newcastle University)
BEng (Electronic and Mechanical Engineering) (Chiba University)

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

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. Chia Kim Seng
PhD (Electrical Engineering) (UTM)
BEng (Electrical – Instrumentation & Control) (UTM)

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

Dr. Hisyam bin Abdul Rahman
PhD (Electrical Engineering) (UTM)
BEng (Electrical - Mechatronic) (UTM)

Dr. Jameel Abdulla Ahmed Mukred
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTM)
BEng (Telecommunication & Electronic) (Industrial Technical Institute Yemen)

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

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

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

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)

Ms. Nor Anija binti Jalaludin
MEng (Mechatronic) (IIUM)
BEng (Electrical) (UTHM)

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

Specialisation Area: Microelectronic Engineering (BEM)

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)

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PhD Engineering (Electronic) (Shizuoka University)
MEng (Electrical) (UiTM)
BEng (Electronic) (Gunma University)

Associate Professor Dr. Mohd Zainizan bin Sahdan
PhD (Electrical Engineering) (UiTM)
MEng (Electrical) (KUiTTHO)
BEng (Electronic - Computer Engineering) (KUiTTHO)

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

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MEng (Electrical) (UTM)
BSc (Electrical) (University of Miami Coral Gables)

Dr. Hasliza binti Hassan
PhD (Electrical Engineering) (UTM)
MEng (Microelectronic) (UKM)
BEng (Microelectronic) (KUKUM)

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

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PhD (Electronic Engineering) (University of Surrey)
MSc (Electrical and Electronic) (University of Surrey)
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PhD (Electronic Engineering) (Massey University)
MEng (Electrical) (KUiTTHO)
BEng (Electrical and Electronic) (UKM)

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PhD (Electrical & Electronic Engineering) (Queen's University Belfast)
BEng (Electrical and Electronic) (Swansea University)

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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)

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

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

Specialisation Area: Medical Electronic Engineering (BEU)

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

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

Associate Professor 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)

Dr. Ashok Vajravelu
PhD (Medical Electronic) (Anna University)
MEng (Process Control and Instrumentation) (Annamalai University)
BEng (Electronics and Communication) (Bharathiar University)

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

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PhD (Biomedical Engineering–Biomechanical) (Kyushu University)
MEng (Biomedical) (UM)
BEng (Electrical) (KUiTTHO)

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PhD (Electrical & Electronic Engineering) (UKM)
MSc (Electrical) (Queen Mary University of London)
BEng (Electrical) (KUiTTHO)

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

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

Ms. Mazita binti Mohamad
MEng (Electrical - Electronic & Telecommunication) (UTM)
BEng (Electronic) (University of Bristol)

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

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

Department of Electrical Engineering (JKEK)

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

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

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 Dr. Dur Muhammad Soomro
PhD (Electrical Engineering) (UTM)
MEng (Electrical Power) (Mehran University of Engineering and Technology)
BEng (Electrical Power) (Mehran University of Engineering and Technology)

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

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

Associate Professor Dr. Md Nor Ramdon bin Baharom
PhD (Electrical & Electronic Engineering) (University of Manchester)
BEng (Electrical & Electronic) (Leeds Metropolitan University)

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)

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
Ph.D (Electronic Engineering) (Muroran Institute of Technology)
MEng (Microelectronic) (University of Newcastle Upon Tyne)
BEng (Electronic) (University of Electro-Communications)

Dr. Md Zarafi bin Ahmad
Ph.D (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. Mohd Fairouz bin Mohd Yousof
Ph.D (High Voltage Engineering) (University of Queensland)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

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

Dr. Nor Akmal binti Mohd Jamail
PhD (Electrical Engineering) (UTM)
MEng (Electrical) (UTHM)
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. Nur Hanis binti Mohammad Radzi
PhD (Electrical Power Engineering) (University of Queensland)
MEng (Electrical Power) (UTM)
BEng (Electrical) (UTM)

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PhD (High Voltage Engineering) (Cardiff University)
BEng (Electrical & Electronic) (Cardiff University)

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

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

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

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

Dr. Roziah binti Aziz
PhD (Electronic Power and Drive) (Newcastle University)
MEng (Electrical) (UTHM)
BEng (Electrical) (UTM)

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

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

Department of Laboratory and Asset Management (JPMA)

Laboratory Manager
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 Fadzli bin Abd Shaib
MEng (Electrical) (UTM)
BEng (Electrical & Electronics) (UNITEN)

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. Jamallullail bin Ibrahim
Cert. (Electrical Engineering) (Poli. Sultan Hj. Ahmad Shah)

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. Mahmod bin Munajat
Cert. (Electronic Communication Engineering) (Poli. Johor Bahru)

Mr. Maslan bin Ahmad
Cert. (Electronic Communication) (Poli. KB)

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

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

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

Mr. Mohamad Fauzi bin Mustaffa
Cert. (Electronic Communication) (Poli. Port Dickson)

Mr. Mohd. Azrul bin Tugiman
Cert. (Electrical Power) (Poli. Sultan Abdul Halim Muadzam Shah)

Mr. Mohd Shahidan bin Madiah
Cert. (Electronic Engineering (Control)) (Poli. Johor Bahru)

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

Mr. Mohd Zaki bin Zakaria
Cert. (Electrical & Electronics Engineering) (Poli. Johor Bahru)

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)

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Cert. (Electrical and Electronic Engineering) (Poli. Port Dickson)

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

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

Mdm. Rosilah binti Rahmat
Cert. (Electronic Communication) (Poli. Sultan Hj. Ahmad Shah)

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

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

Mdm. Saniah binti Suluki
Cert. (Electronic Communication) (Poli. Sarawak)

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

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

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

Mr. Syafiq Afiq bin Sulaiman
Cert. (Electrical Engineering) (Poli. Johor Bahru)

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. Johor Bahru)

Mdm. Zubaidah binti Hj. Mohd Yusoff
Cert. (Electrical Power Engineering) (Poli. Sultan Abdul Halim Muadzam Shah)

Mdm. Junaidah binti Azlan
Sijil Pelajaran Malaysia (SPM)

Mdm. Wasnita binti Hamsan
Sijil Pelajaran Malaysia (SPM)

LIST OF PROFESSIONAL ENGINEERS (PENG) AND CHARTERED ENGINEERS (CENG)

1	Assoc. Prof. Ir. Dr. Abd Kadir Bin Mahamad	PEng
2	Assoc. Prof. Ir. Dr. Tee Kian Sek	PEng
3	Assoc. Prof. Ir. Dr. Soon Chin Fhong	PEng
4	Ir. Dr. Budiman Azzali Bin Basir	PEng
5	Ir. Ts. Dr. Norfaiza Binti Fuad	PEng
6	Dr. Mariyam Jamilah Binti Homam	CEng (UK)
7	Assoc. Prof. Dr. Audrey Huong	CEng (UK)
8	Assoc. Prof. Dr. Nabilah Binti Ibrahim	CEng (UK)
9	Dr. Chia Kim Seng	CEng (UK)
10	Prof. Dr. Mohammad Faiz Liew Bin Abdullah	CEng (UK)
11	Ts. Dr. Mohd. Norzali Bin Hj Mohd	CEng (UK)
12	Dr. Rahmat Bin Sanudin	CEng (UK)
13	Ts. Dr. Mohd Razali Bin Md Tomari	CEng (UK)
14	Assoc. Prof. Dr. Siti Zarina Binti Mohd Muji	CEng (UK)

PROGRAMME INFORMATION

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO	Statement
1	able to build a career and become a leader in relevant electronic engineering fields;
2	recognised as professional electronic engineers; and
3	actively participate in relevant activities for the betterment of themselves and society by exhibiting highest ethical and professional standard.

PROGRAMME LEARNING OUTCOMES (PLO)

PLO	PLO Statement
1	Engineering Knowledge - Apply knowledge of mathematics, natural science, engineering fundamentals (natural sciences, mathematics, engineering fundamentals) and an engineering specialisation to the solution of complex engineering problems
2	Problem Analysis - Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences
3	Design/Development of Solutions - 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
4	Investigation – Conduct investigation of complex engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5	Modern Tool Usage - Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations
6	The Engineer and Society - Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems
7	Environment and Sustainability - Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts
8	Ethics - Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice
9	Individual and Team Work - Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings
10	Communication - Communicate effectively 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, and give and receive clear instructions
11	Project Management and Finance - Demonstrate 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, to manage projects in multidisciplinary environments
12	Life Long Learning - Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

CERTIFICATE OF ACCREDITATION

No. Sijil: 1339
BEM/EAD/02-8/WA/03-2 (002)

LEMBAGA JURUTERA MALAYSIA

(Penandatangan Penuh Washington Accord mulai 18 Jun 2009)

SIJIL AKREDITASI

DENGAN INI MEMPERAKUKAN BAHAWA KURSUS PENGAJIAN

BACHELOR OF ELECTRONIC ENGINEERING
WITH HONOURS
(4-Year Programme after STPM)

YANG DIKENDALIKAN OLEH:

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

TELAH MENDAPAT PENGIKTIRAFAN RASMI BAHAWA KELAYAKAN AKADEMIK YANG DIANUGERAHKAN ADALAH SELARAS DENGAN STANDARD DAN KUALITI YANG TELAH DITETAPKAN OLEH LEMBAGA JURUTERA MALAYSIA

PERAKUAN BAGI TAHUN BERGRADUAT 2019 HINGGA 2024

.....
DATO' SRI Ir. Dr. ROSLAN BIN MD TAHA
Yang Dipertua

.....
Ir. HIZAMUL-DIN AB. RAHMAN
Pendaftar

Penganugerahan Perakuan Akreditasi ini tertakluk kepada peraturan-peraturan dan syarat-syarat yang dinyatakan di sebelah.

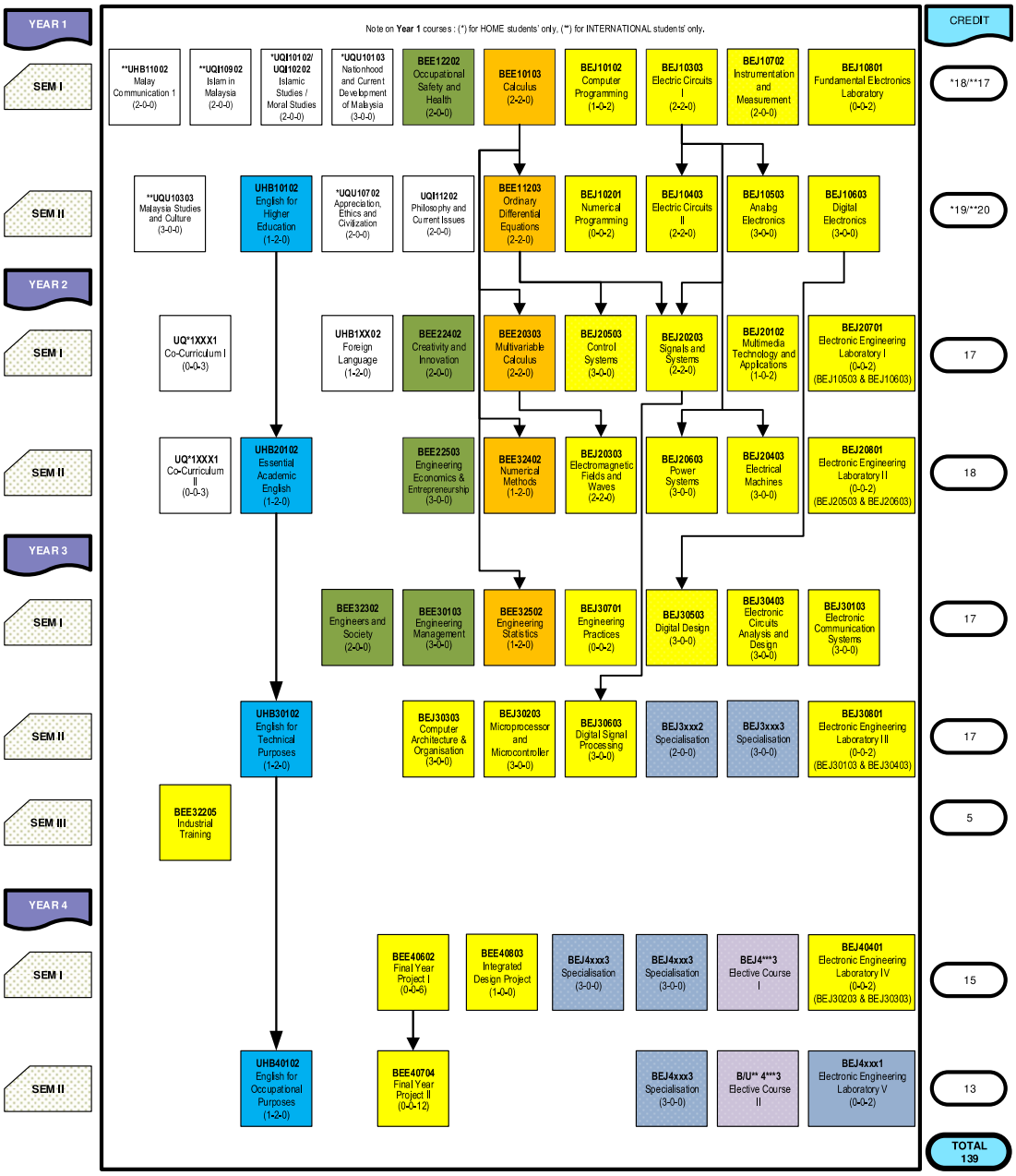
Tarikh Perakuan Dikeluarkan:17.04.2019

ROADMAP

FOR INTAKE 2020/2021 & ONWARDS

UTHM
Universiti Tun Hussein Onn Malaysia

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING
BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS



Note: The course offerings are subject to change.

Note: * for HOME students only

STUDY PLAN

YEAR 1

Sem.	Course Code	Course Name	Credit
1	UQI10102	*Islamic Studies (local muslim)	2
	UQI10202	*Moral Studies (local non-muslim)	
	UQI10902	**Islam in Malaysia (international)	
	UQU10103	*Nationhood and Current Development of Malaysia (local)	3
	UQU10303	**Malaysia Studies and Culture (international)	
	BEE12202	Occupational Safety and Health	2
	BEJ10102	Computer Programming	2
	BEJ10303	Electric Circuits I	3
	BEJ10702	Instrumentation and Measurement	2
	BEE10103	Calculus	3
	BEJ10801	Fundamental Electronics Laboratory	1
	Total		**18**

Sem.	Course Code	Course Name	Credit
2	UHB10102	English for Higher Education	2
	UQU10702	*Appreciation, Ethics and Civilization	2
	UQI11202	*Philosophy and Current Issues	2
	BEE11203	Ordinary Differential Equations	3
	BEJ10201	Numerical Programming	1
	BEJ10403	Electric Circuits II	3
	BEJ10503	Analog Electronics	3
	BEJ10603	Digital Electronics	3
	Total		**19**

YEAR 2

Sem.	Course Code	Course Name	Credit
3	UQ*1xxx1	Co-Curriculum I	1
	UHB1XX02	*Foreign Language (local)	2
	UHB11002	**Malay Communication 1 (international)	
	BEE22402	Creativity and Innovation	2
	BEE20303	Multivariable Calculus	3
	BEJ20203	Signals and Systems	3
	BEJ20102	Multimedia Technology and Applications	2
	BEJ20503	Control Systems	3
	BEJ20701	Electronic Engineering Laboratory I	1
	Total		**17**

Sem.	Course Code	Course Name	Credit
4	UQ*1XXX1	Co-Curriculum II	1
	UHB20102	Essential Academic English	2
	BEE22503	Engineering Economic and Entrepreneurship	3
	BEE32402	Numerical Methods	2
	BEJ20303	Electromagnetic Fields and Waves	3
	BEJ20603	Power Systems	3
	BEJ20403	Electrical Machines	3
	BEJ20801	Electronic Engineering Laboratory II	1
	Total		**18**

STUDY PLAN

YEAR 3

Sem.	Course Code	Course Name	Credit
5	BEE32302	Engineers and Society	2
	BEE30103	Engineering Management	3
	BEE32502	Engineering Statistics	2
	BEJ30503	Digital Design	3
	BEJ30403	Electronic Circuits Analysis and Design	3
	BEJ30103	Electronic Communication Systems	3
	BEJ30701	Engineering Practices	1
	Total		**17**

Sem.	Course Code	Course Name	Credit
6	UHB30102	English for Technical Purposes	2
	BEJ30303	Computer Architecture and Organization	3
	BEJ30203	Microprocessor and Microcontroller	3
	BEJ30603	Digital Signal Processing	3
	BEJ30801	Electronic Engineering Laboratory III	1
		Elective Compulsory Course	3
		Elective Compulsory Course	2
	Total		**17**

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

YEAR 4

Sem.	Course Code	Course Name	Credit
8	BEE40602	Final Year Project I	2
	BEE40803	Integrated Design Project	3
	BEJ40401	Electronic Engineering Laboratory IV	1
		Elective Compulsory Course	3
		Elective Compulsory Course	3
		Elective Optional Course	3
	Total		**15**

Sem.	Course Code	Course Name	Credit
9	UHB40102	English for Occupational Purposes	2
	BEE40704	Final Year Project II	4
		Elective Compulsory Course	3
		Elective Optional Course	3
		Elective Compulsory Course - Lab	1
	Total		**13**

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STUDY PLAN

ELECTIVE COURSES – COMMUNICATION ENGINEERING

Compulsory

Sem.	Course Code	Course Name	Credit
6/8	BEJ31103	Electromagnetic Wave Propagation	3
	BEJ31202	Data Communication Network	2
	BEJ41103	Digital Communication	3
	BEJ41203	Wireless and Mobile Communication	3
	BEJ41303	Optical Communication	3
	BEJ41001	Communication Engineering Laboratory	1
	Total		**15**

Optional – Choose 2

Sem.	Course Code	Course Name	Credit
8/9	BEJ41403	Satellite Communication and Navigation	3
	BEJ41503	Wireless Sensor and Mobile Ad-Hoc Network	3
	BEJ41603	Antenna Theory and Applications	3
	BEJ41703	Electromagnetic Compatibility	3
	BEJ41803	RF & Microwave Engineering	3
	Total		**15**

ELECTIVE COURSES – COMPUTER ENGINEERING

Compulsory

Sem.	Course Code	Course Name	Credit
6/8	BEJ32103	Data Structures and Algorithms	3
	BEJ32202	Operating Systems	2
	BEJ42103	Computer Networks	3
	BEJ42203	Embedded Systems Design	3
	BEJ42303	Software Engineering	3
	BEJ42001	Computer Engineering Laboratory	1
	Total		**15**

Optional – Choose 2

Sem.	Course Code	Course Name	Credit
8/9	BEJ42403	Computer System Engineering	3
	BEJ42503	Advanced Microcontroller	3
	BEJ42603	VLSI System Design	3
	BEJ42703	Computer Security	3
	BEJ42803	Artificial Intelligence	3
	BEJ42903	Image Processing	3
	Total		**18**

STUDY PLAN

ELECTIVE COURSES – MICROELECTRONIC ENGINEERING

Compulsory

Sem.	Course Code	Course Name	Credit
6/8	BEJ33103	Fundamental of Semiconductor	3
	BEJ33002	Photonic Devices	2
	BEJ43103	VLSI System	3
	BEJ43203	Micro Fabrication	3
	BEJ43303	Advanced Semiconductor Devices	3
	BEJ43001	Microelectronic Engineering Laboratory	1
	Total		**15**

Optional – Choose 2

Sem.	Course Code	Course Name	Credit
8/9	BEJ43403	MEMS Technology	3
	BEJ43503	IC Packaging	3
	BEJ43603	Material Characterization	3
	BEJ43703	Nanoelectronic Devices	3
	BEJ43803	Reliability and Testability in IC Device	3
	Total		**15**

ELECTIVE COURSES – MECHATRONIC AND ROBOTIC ENGINEERING

Compulsory

Sem.	Course Code	Course Name	Credit
6/8	BEJ34103	Industrial Automation Systems	3
	BEJ34202	Vision Systems	2
	BEJ44103	Intelligent Control Systems	3
	BEJ44203	Robotic Systems	3
	BEJ44303	Real Time Embedded Systems	3
	BEJ44001	Mechatronic Engineering Laboratory	3
	Total		**17**

Optional – Choose 2

Sem.	Course Code	Course Name	Credit
8/9	BEJ44403	Manufacturing Process	3
	BEJ44503	Digital Control Systems	3
	BEJ44603	Process Control Systems	3
	BEJ44703	Mobile Robotics	3
	BEJ44803	Mechatronic Mechanism	3
	BEJ44903	Instrumentation and Measurement in Oil and Gas	3
	Total		**18**

STUDY PLAN

ELECTIVE COURSES – MEDICAL ELECTRONIC ENGINEERING

Compulsory

Sem.	Course Code	Course Name	Credit
6/8	BEJ35103	Human Physiology	3
	BEJ35202	Medical Equipment Management and Safety	2
	BEJ45103	Medical Imaging	3
	BEJ45203	Principle of Physiological Devices	3
	BEJ45303	Medical Instrumentation	3
	BEJ45001	Medical Electronics Engineering Laboratory	3
	Total		**17**

Optional – Choose 2

Sem.	Course Code	Course Name	Credit
8/9	BEJ45403	Telemedicine System And Applications	3
	BEJ45503	Biomedical Optics	3
	BEJ45603	Biomaterial	3
	BEJ45703	Biomedical Engineering and Applications	3
	BEJ45803	Rehabilitation System Engineering	3
	BEJ45903	BioMEMS and Medical Microdevices	3
	Total		**18**

ELECTIVE COURSES – IR 4.0

Compulsory

Sem.	Course Code	Course Name	Credit
-			
	Total		**0**

Optional – Choose 2

Sem.	Course Code	Course Name	Credit
8/9	BEE40903	Introduction to Big data	3
	BEE41003	Data Science and Applications	3
	BEE41103	HCIA Routing and Switching	3
	BEE41203	HCIA Cloud Computing	3
	BEE41303	HCIA Artificial Intelligence	3
	UQU41203	Professional at Work	3
	Total		**18**

SYNOPSIS OF COMPULSORY UNIVERSITY COURSES

UHB 10100 English for Higher Education

Synopsis:
This course focuses on fulfilling students' academic requirements such as the acquisition of reading, writing, listening and speaking skills in English. The course also concurrently provides opportunities for students to acquire basic grammar knowledge to complement the acquisition of English language. Students will be reinforced on aspects of English language oral and written skills that are most relevant to them in their academic work. By the end of the course, students should be able to use English for a wide range of academic activities.

References:

1 Abd. Aziz, A et al , (2005). English for Academic Communication. Kuala Lumpur: Mc Graw Hill Malaysia. Call number: PE1128.A2 .E53 2005.
2 Koh, S.L. (2005). MUET Moments: Malaysia University English Test. Selangor: Pearson. Call number: PE1128 .K63 2005
3 Richards,C. (2009). Longman Text MUET: A Strategic Approach. Petaling Jaya: Pearson Malaysia. Call number: PE1128 .K97 2009
4 Heylan, K. English for academic purpose, London: Routledge, 2006. Call number: PE1128.A2 .H94 2006
5 Kaur, H.(2005). Explore MUET. Kuala Lumpur: Fajar Bakti Sdn. Bhd.

UHB 20102 Essential Academic English

Synopsis:
This course focuses on fulfilling students' academic requirements such as the acquisition of reading, writing, listening and speaking skills in English. The course also concurrently provides opportunities for students to acquire basic grammar knowledge to complement the acquisition of English language. Students will be reinforced on aspects of English language oral and written skills that are most relevant to them in their academic work. By the end of the course, students should be able to use English for a wide range of academic activities.

Pre-requisite: UHB 10100 English for Higher Education

References:

1 Abd. Aziz, A et al , (2005). English for Academic Communication. Kuala Lumpur: Mc Graw Hill Malaysia. Call number: PE1128.A2 .E53 2005.
2 Koh, S.L. (2005). MUET Moments: Malaysia University English Test. Selangor: Pearson. Call number: PE1128 .K63 2005
3 Richards,C. (2009). Longman Text MUET: A Strategic Approach. Petaling Jaya: Pearson Malaysia. Call number: PE1128 .K97 2009
4 Heylan, K. English for academic purpose, London: Routledge, 2006. Call number: PE1128.A2 .H94 2006
5 Kaur, H.(2005). Explore MUET. Kuala Lumpur: Fajar Bakti Sdn. Bhd.

UHB 30102 English for Technical Purpose

Synopsis:
This course introduces students to report writing skills needed at tertiary level. Students will learn basic report writing skills such as proposals, progress report, informational and analytical report. In order do this, they will learn how to collect data using questionnaires. The data collected will be analyzed, transferred into graphic forms and presented orally and in writing. Based on the analysis of data, students will be able to draw conclusions and make recommendations.

Pre-requisite: UHB 20102 Essential Academic English

References:

1 Dorothy Cheung et. al. (1999). Report writing for engineering students. 2nd ed.Singapore: Prentice Hall. Call number: PE1475 .R46 1999 N3.
2 Finkelstein, J. (2008). Pocket Book of technical writing. 3rd Ed. Singapore: McGraw Hill. Call number: T11 .F56 2008.
3 Gerson, S. J. & Gerson, S. M. (2003). Technical writing: Process and product. 3rd Ed. New Jersey: Prentice Hall. Call number: PE1475 .G47 2000.
4 Kolin, P. C. (2006). Successful writing at work. Concise Ed. USA: Houghton Mufflin Company. Call number: PE1408 .K64 2009.
5 Lakshmy Anantha Krishnan et. al. (2003). Engineering your report: From start to finish. Singapore: Prentice Hall. Call number: T11 .E64 2006.

UHB 40102 English for Occupational Purpose

Synopsis:
This course emphasises on task-based approach and focuses on developing students' delivery of speech in oral interactions and presentations. Importance is given on mastery of self-directed learning, teamwork, research, oral presentations, reasoning and creativity. This course also enables students to acquire knowledge and skills necessary for conducting and participating in meetings, including writing of meeting documents. Students will also be exposed to the techniques of conducting interviews.

Pre-requisite: UHB 30102 English for Technical Purposes

References:

1 Cheesebro,T, O'Connor, L. & Rios, F. (2007). Communication skills: preparing for career success (3rd ed.) Upper Saddle River, NJ: Pearson.
2 Davies, W.J. (2001) Communication skills: a guide for engineering and applied science student (2nd ed.) . London: Prentice Hall.
3 Joan van Emden, L. (2004). Presentation skills for students. New York: Palgrave Macmillan.
4 Richard Johnson-Sheehan (2005). Technical Communication Today. New York: Pearson.
5 Salbiah Seliman et. al. (2004). English Communication for learners in engineering. Malaysia: Prentice Hall.

UHB 11002 **Malay Communication 1 (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.
3 Mardian Shah Omar. (2016). Perbualan Mudah Bahasa Melayu Untuk Pelancong Asing. Kuala Lumpur: Dewan Bahasa dan Pustaka
4 Nik Safiah Karim, Farid M. Onn, Hashim Haji Musa dan Abdul Hamid Mahmood. (2004). Tatabahasa Dewan, Edisi Baru. Kuala Lumpur: Dewan Bahasa dan Pustaka.
5 Norhashimah Jalaluddin, Mardian Shah Omar dan Norzilawati Jais. (2006). Bahasa Melayu untuk Penutur Asing. Buku 1 dan 2. Kuala Lumpur: Dewan Bahasa dan Pustaka.
6 Siti Hajar Abdul Aziz. (2008). Siri Pendidikan Guru Bahasa Melayu I. Shah Alam: Oxford Fajar Sdn. Bhd.

UHB 1XX02 Foreign Language

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

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

UQI 10102 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:

1 Abd Shakor dan Lain-lain (2017), Modul Pembelajaran Pengajian Islam (UQI10102/10602), cetakan keenam 2017, Batu Pahat: Penerbit UTHM.
2 Roziah Sidik (2011), Pengajian Islam, Selangor: Oxford Fajar. (BP42 .R69 2011)
3 al-Anjari, Fouzi (2013), Al-Asya'irah: Akidah Sebenar Ahli Sunnah Wal Jamaah, Seremban: Creative Publika. (BP166.14 .A54 2013)
4 Ramli Awang (2013), Akidah Penghayatan Tauhid al-Quran, Johor: Penerbit UTM Press. (BP165.5 .R35 2013)
5 T. Nama (2013), Pengurusan, Etika Kerja dan Personaliti: Perspektif Islam, Perlis: UMP. (BP190.5.M28 .P46 2013)
6 Mohd Fauzi Mohd Amin (2011), Pemerkasaan Fardhu Kifayah berteraskan al-Quran dan al-Sunnah, Negeri Sembilan: USIM. (BP130.8 .P45 2011)

7 Azzam, Abdul Aziz Muhammad (2010), Fiqh Muamalat: Sistem Transaksi dalam Fiqh Islam, Jakarta: Amzah. (BP158.C59 .A99 2010)
8 Harun Din (Dr.) (1990), Manusia Dan Islam, Kuala Lumpur: Dewan Bahasa dan Pustaka. (BP174 .M36 1990)
9 Muhammad Ahmad Abdul Jawwad (2004), Pengurusan Yang Profesional Dalam Islam, Kuala Lumpur: Penerbit Berlian. (BP173.77. J39 2004)
10 Mustafa Abdul Rahman (1998), Hadith 40, Kuala Lumpur: Dewan Pustaka Fajar. (BP135. A2 .M87 1998)
11 Ismail Haji Ali, (1995), Pengertian dan Pegangan Iktikad yang benar: Ahli Sunnah Wal Jamaah: Kuala Lumpur: Penerbitan al-Hidayah. (BP166.78 .P46 1995)
12 Abdur Rahman I.Doi (1995), Undang-undang Syariah, terjemahan Rohani Abdul Rahim, Kuala Lumpur : Dewan Bahasa dan Pustaka. (BP173.6 .A72 1995)
13 Paizah Haji Ismail (1991), Undang-undang Jenayah Islam, Kuala Lumpur: Dewan Pustaka Islam, Angkatan Belia Islam Malaysia. (BP144 .P35 1991)
14 Mohammad Muslehudin (1989), Insuran dan Hukum Islam, Kuala Lumpur: Dewan Bahasa dan Pustaka. (BP190.5. I67 M65 1989)
15 Muhammad Sulaiman Haji Yasin (1988), Pengantar Aqidah, Kuala Lumpur: Dewan Bahasa dan Pustaka. (BP166. M67 1984)

UQI 10202 Moral Studies

Synopsis:
This course explains the concepts of morals, ethics, ethics and values and their importance to human life. Discussion covers the divisions, philosophies, standards and moral theories as well as the pure values of the great religions of the world. Morality in various fields of employment, ethics in science and technology as well as current moral issues.

References:
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 (1992), Falsafah Etika: Perbandingan Islam dan Barat, Kuala Lumpur: JPM. (BJ1291 .M53 1992)

UQU 10103 *Nationhood and Current Development of Malaysia

Synopsis:
This course will provide students a fundamental concept, the processes of formation and development of Malaysia. The topics covered include the concept of state, Malacca Kingdom, implication of imperialism and colonization, spirit of patriotism and nationalism, independence and formation of Malaysia. Besides, students will also be exposed to the constitution of Malaysia, Malaysian Government System, Economic and Social Development Policy as the main policy in the national development. At the end of the course students will able to appreciate the roles and responsibilities of a good citizen to the country.

References:

1 Siti Sarawati Johar, Fauziah Ani, Harliana Halim, Rosman Md Yusoff, Shahidah Hamzah, Noranifitri Md.Nor, Zahrul Akmal Damin, Khairunesa Isa, Lutfan Jaes, Ku Hasnan Ku Halim, Shamsaadal Sholeh Saad, Khairul Azman Mohd Suhaimy, Md. Akbal Abdullah, Khairol Anuar Kamri, dan Adi Syahid Mohd Ali (2018). Modul Pembelajaran: UQU 10103/UWS 10103 Kenegaraan dan Pembangunan Mutakhir Malaysia Versi Ke-4. Batu Pahat: Penerbit UTHM.

2 Nazaruddin Mohd Jali, Ma'rof Redzuan, Asnarulkhadi Abu Samah, & Ismail Mohd Rashid. (2005). Pengajian Malaysia. Petaling Jaya: Prentice Hall. [DS596.6.P46 2001 N2]

3 Ruslan Zainudin, Mohd Mahadee Ismail, & Zaini Othman. (2005). Kenegaraan Malaysia. Shah Alam: Fajar Bakti. [JQ715.R87 2005]

4 Mohd. Ashraf Ibrahim. (2004).Gagasan Bangsa Malayan yang Bersatu 1945-57. Bangi : Penerbit UKM. [DS597.M37 2004]

5 Noor Aziah Mohd. Awal. (2003). Pengenalan kepada Sistem Perundangan di Malaysia. Petaling Jaya: International Law Book Services. [KPG68.N66 2003]

6 Andaya, B.W. & Andaya, L.Y. (1982). A History of Malaysia. London: MacMillan. [DS596.A52 2001]

7 Abdul Aziz Bari. (2002). Majlis Raja-Raja. Kuala Lumpur : Dewan Bahasa dan Pustaka. [JQ1062.A58.A39 2002].

8 Aziz Deraman. (1992). Tamadun Melayu dan Pembinaan Bangsa Malaysia. Kuala Lumpur: Arena Ilmu Sdn. Bhd. [HN700.6.A952 2000]

UQU 10303 **Malaysian Studies and Culture (Foreign student only)

Synopsis:
This course will provide students in basic understanding of Malaysia from various perspectives. Topics to be discussed include Malaysia in relation to its history and politic, constitution of Malaysia, system and administration structure of Malaysia, achievement and international affairs. In addition, students will also be exposed to the social community and solidarity, religion, cultural and heritage. Teaching and learning process through experiential learning, lecture and assignment enables students to acquire knowledge and appreciates the reality of life in Malaysia.

References:

1 Abdul Halim Nasir (2004). Mosque Architecture in the Malay World. Bangi : Penerbit Universiti Kebangsaan Malaysia. [NA4670 .A23 2004]

2 Andaya, B.W. and Andaya, L. Y. (2001). A History of Malaysia. Hampshire : Palgrave. [DS596.A52 2001 N1]

3 Chew Fong Peng. (2009). Culture, language and literature in Malaysian society : plural culture and society in Malaysia. Kuala Lumpur : Jabatan Kebudayaan dan Kesenian Negara [DS594 .C53 2009]

4 Harding, Andrew. (2012). The constitution of Malaysia : a contextual analysis. Portland: Hart [KPG1744.51957.H37]

Courses listed below are also part of University requirement:

UQU 10202	*Ethnic Relations
UQU 10202	Islamic and Asian Civilization
UQI 10902	** Islam in Malaysia (foreign student only)
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.*

SYNOPSIS OF CORE MATHEMATICS COURSES

BEE 10103 Calculus

Synopsis:
This course is mainly about the study of mathematical concept by using knowledge of calculus. First, students will be introduced to the concepts of limits and continuity including the limit at a point, limit at infinity, techniques to compute limits, and continuity at a point. Next, the students will learn the techniques of differentiation and integration as well as application of differentiation and integration in circuit analysis. Finally, the students will gain knowledge on further differentiation and integration, which covers inverse function, inverse trigonometry as well as inverse hyperbolic functions.

References:

1 Nur Anida Jumadi, Muhammad Anas Razali, Rosnah Mohd Zin, Wan Nur Hafsha Wan Kairuddin and Farhanahani Mahmud. (2019). “Engineering Mathematics 1”. Malaysia: Penerbit UTHM.
2 Abd. Wahid Md. Raji, Hamisan Rahmat, Ismail Kamis, Mohd Nor Mohamad, Ong Chee Tiong. (2003). “Calculus for Science and Engineering Students.” Malaysia: UTM Publication. Call number: QA303.3 .C34 2008, QA152.3 .S73 2007.
3 Anton, H., Bivens, I., Davis, S. (2005). “Calculus.” 8th Ed. USA: John Wiley & Sons, Inc.Call number: QA303.A576 2005, QA303 .A57 2002, QA303.2 .A57 2010, QA303.2 .A574 2008, QA303.2 .A575 2005.
4 Smith, R. T., Minton, R. B. (2006). “Calculus: Concept & Connection.” New York: McGraw-Hill.
5 Goldstein, Larry, Lay, David, Schneider, David. (2004). “Calculus and its Applications. Upper Saddle River, NJ: Pearson Education. Call number: QA303.2 .B75 2010, QA303 .G63 1996, QA303 .G63 1993.
6 Stroud, K. A. (2005). “Engineering Mathematics.” 5th Ed. London: Macmillan Press Ltd. Call number: TA330 .S77 2007, TA330 .S77 1995,QA433 .S77 2005, QA371 .S77 2005.

BEE 11203 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.

BEE 20303 Multivariable Calculus

Synopsis:
This course is intended to provide students with the knowledge of Functions of Several Variables, Coordinate System, Vector Algebra, Multiple Integrals and Vector Calculus, as the basic knowledge to support their engineering courses.

Pre-requisite: BEE 10103 Calculus

References:

1 Abd Wahid Md Raji, Phang Chang, Phang Piau, (2007) Engineering Mathematics III BSM2913. Penerbit UTHM. (Learning Module).
2 Howard Anton, Irl Bivens, Stephen Davis (2005). Calculus (8th Edition). New York: John Wiley. (QA303 .A576 2005).
3 Straud, K.A. (1996). Further Engineering Mathematics. (3rd Edition). England: Macmillian Publication (TA330 .S773 1996)
4 Robert T. Smith, and Roland B. Minton (2012). Calculus Early Transcendental Function (3rd Edition). New York: McGraw-Hill (QA303.2 .S644 2012).
5 James Stewart (2003). Calculus. USA. Thomson Learning Inc. (QA303.2 .S72 2003).

BEE 32402 Numerical Methods

Synopsis:
This course introduces several techniques to solve mathematical engineering problems using numerical estimation and requires an elementary knowledge of functions, calculus, 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. (2017). Numerical Methods with CASIO FX-570 ES Plus 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].

BEE 32502 Engineering Statistics

Synopsis:
This course is designed to investigate the real data using the method of maximum likelihood to provide point estimation, given unknown parameters in the models. Maximum likelihood will be the central unifying approach. Examples will involve a distribution with a single unknown parameter, in cases for which the confidence intervals may be found by using the Central Limit Theorem. The culmination of the course will be the link of maximum likelihood technique to a simple straight line fit with normal errors.

References:

1 Norziha Che Him et al. (2009). Engineering Statistics (BSM 2922) First Edition. Pusat Pengajian Sains, UTHM
2 Nafisah @ Kamariah et. al. (2004). Engineering Statistics. Second Edition. Pusat Pengajian Sains, KUiTTHO. Call number: QA276.12 .M66 2004
3 Robert S. Witte (2017).Statistics 11th Edition, Wiley. ISBN-13: 978-1119386056
4 James T. McClave (2016). Statistics (13th Edition). Pearson. ISBN-13: 978-0134080215
5 Gareth James et al. (2017). An Introduction to Statistical Learning: with Applications in R. Springer. ISBN-13: 978-1461471370

SYNOPSIS OF CORE FACULTY COURSES

BEE 12202 Occupational Safety and Health

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

References:

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

BEE 22402 Creativity and Innovation

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

References:

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

BEE 22503 Engineering Economic and Entrepreneurship

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

References:

1 DeGarmo, E. Paul (1997). Engineering Economy, Prentice-Hall,TA177.4. E63. 1997.
2 Sullivan, William G. (2009). Engineering Economy, Pearsonl, TA177.4 .S94 2009.
3 Kamariah Ismail, Noraini Abu Talib, Mohd. Hassan et al. (2009). Technology Entrepreneurship, Prentice-Hall. Call number HD45.T44 2009.
4 UiTM Entrepreneurship Study Group (2004). Fundamentals of Entrepreneurship, revised edition, Prentice-Hall. Call number HB615 .F86 2004.
5 Bruce R. Barringer, R. Duane Ireland (2010). Entrepreneurship: successfully launching new ventures, 3 rd 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. Callnumber 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.

BEE 30103 Engineering Management

Synopsis:
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 also the management tools which comprises of taguchi, kaizen, enterprise resource planning (ERP) and six-sigma are exposed to the students. Other elements such as quality management, project management and its activities, lean production, maintenance and reliability are also included in this course.

References:

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

BEE 32302 Engineer and Society

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

References:

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

SYNOPSIS OF CORE PROGRAMME COURSES

BEJ 10102 Computer Programming

Synopsis:
This course provides comprehensive programming concepts through the use of high-level programming languages such as C or C++. 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 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.
2 King, K.N. (2008). C Programming: A Modern Approach. 2nd Ed. New York: W.W.Norton. Call number: QA76.73.C15 .K56 2008.
3 Stevenson, D.E. (2007). Programming Language Fundamentals by Example. 3rd ed. Auerbach: Taylor and Francis. Call number: QA76.6 .S73 2007.
4 Delores M. Etter and Jeanine A. Ingber (2008). Engineering Problem Solving with C++. 2nd ed. Prentice-Hall. Call number: QA76.73.C153 .E874 2008.
5 D.S. Malik (2011). C++ Programming: From Problem Analysis to Program Design. 5th ed. Course Technology, Cengage Learning. Boston, USA. Call number: QA76.73.C153 .M345 2011.

BEJ 10201 Numerical Programming

Synopsis:
To give thorough comprehension and practice in developing programs with MATLAB where the knowledge is to be applied into other related communications subjects.

References:

1 David C. Kuncicky, MATLAB Programming, Pearson Prentice Hall, 2004. Call Number: QA297.K86 2004.
2 Amos Gilat, MATLAB: An Introduction with Application, 2nd Ed, John Wiley & Son, 2005.Call Number: QA297.G54 2005.
3 Brian R.Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg, A guide to MAtlab for Beginners and Experienced Users,2nd Ed,Cambridge University Press, 2006. Call Number: QA297.H86 2006.
4 Palm, William J. Introduction to MATLAB 7 for engineers, Boston: McGraw-Hill, 2005. CallNumber: TA345.P34 2005.
5 Beucher. O. and Weeks M., Introduction to MATLAB and Simulink: a Project approach, Hingham, MA: Infinity Science, 2008. Call Number: TA345.B48 2008.
6 Dolores M. Etter and David C. Kuncicky, Introduction to MATLAB 7, Upper Saddle River, NJ: Pearson Education, 2004.Call Number: TA345.E876 2005.

BEJ 10303 Electric Circuits I

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

References:

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

BEJ 10403 Electric Circuits II

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

Pre-requisite: BEJ 10303 Electric Circuits I

References:

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

BEJ 10503 Analog Electronics

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

Pre-requisite: BEJ 10103 Electric Circuits I

References:

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

BEJ 10603 Digital Electronics

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

References:

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

BEJ 10702 Instrumentation and Measurement

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

References:

1 J. P. Bentley, Principles of Measurement System, 3 rd Edition. Pearson Prentice Hall, 1995. Call number: QC53 .B46 1995.
2 R. G. Gupta, Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting, McGraw Hill, 2001. Callnumber: TK7870.2 .G86 2001.
3 L. D. Jones, and C. A. Foster, Electronic Instruments and Measurements. Prentice Hall International Edition, 1991. Call number: TK7878.4 .J66 1991.
4 D. A. Bell, Electronic Instrumentation and Measurements, 2nd Edition. Prentice Hall Career and Technology, 1994. Call number: TK7878 .B45 1994.

BEJ 10801 Fundamental Electronics Laboratory

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

References:

1 Ida, Nathan,Sensors, actuators, and their interfaces : a multidisciplinary introduction, SciTech Publishing, 2014, Call number TA165 .I32 2014
2 Seksena, S.B Lal, Fundamentals of Electrical Engineering, Cambridge University Press, 2016.Call number TK146 .S44 2016
3 Alexander, Charles K, Fundamentals of electric circuits, McGraw-Hill, 2013. Call number TK454 .A43 2013

BEJ 20102 Multimedia Technology and Applications

Synopsis:
This course is a study of Multimedia Engineering theories, practices and issues through the use of multimedia system tools. This is achieved by understanding multimedia development processes in audio, video and image in terms of their respective Data Representations, Multimedia Communication and Compression Methods.

References:

1 Syed Mahbubur Rahman (2008). Multimedia technologies: concepts, methodologies, tools and applications. London: Information Science Reference. Call Number: QA76.575 .R33 2008 v.1, QA76.575 .R33 2008 v.2, QA76.575 .R33 2008 v.3.
2 Banerji, Ashok (2010). Multimedia technologies. New Delhi: Tata McGraw Hill. ISBN : 9780070669239
3 Havaldar, Parag and Medioni, Gerard (2010). Multimedia Systems: Algorithms, Standards, and Industry Practices. Boston, MA: Course Technology Cengage Learning. Call Number: QA76.575 .H39 2010
4 Barz, Hans W. (2016). Multimedia networks and their applications. Hoboken : John Wiley & Sons Inc. Call Number : TK5105.15 .B27 2016
5 Guan, Ling (2012). Multimedia image and video processing. Boca Raton, FL: CRC Press. Call Number: QA76.575 .M853 2012.

BEJ 20203 Signals and Systems

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

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

References:

1 Nagoor Kani. Signals and Systems, Tata McGraw Hill Education Private Limited, 2010. Call Number: TK5102.9.K36 2010.
2 Mahmood Nahvi. Signals and Systems, McGraw-Hill, 2014. Call number: TK5102.9.N33 2014.
3 S. Poornachandra and B. Sasikala. Signals and Systems. 3rd Edition, Tata McGraw Hill Education Private Limited, 2010. Call Number: QA402.P66 2010.
4 V. Oppenheim, Alan S. Willsky and S. Hamid Nawab. Signals and Systems. 2 nd Edition, New Jersey: Prentice-Hall, 2014. Call Number: QA402 .O66 2014.
5 David McMahon. Signals and Systems demystified. Mc Graw Hill, 2007. Call Number: TK5102.9 .M38 2007.
6 Alexander D. Poularikas. Signals and Systems Primer with MATLAB. CRC Press 2007. Call Number: TK5102.9 .P68 2007.
7 Delores M Etter, Introduction to MATLAB 7, Prentice Hall, 2005. Call Number: TA345 .E876 2005.
8 Chi-Tsong Chen. Signals and Systems. Oxford University Press, 2004. Call Number: QA402.
9 Simon Haykin and Barry V. Veen, Signals and Systems, Wiley & Sons, 2003. Call Number: TK5102.5 .H39 2003.
10 Delores M Etter, Introduction to MATLAB for Engineers andScientists, Prentice Hall, 1996. Call Number: QA297 .E88 1996.

BEJ 20303 Electromagnetics Fields and Waves

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

Pre-requisite: BEE 20303 Multivariable Calculus

References:

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

BEJ 20403 Electrical Machines

Synopsis:
Electrical principle is an important aspect of electrical engineering study which includes basic operations and characteristics of various ac and dc electrical circuits and machines. The study of this subject would allow students to tackle problems in the actual electrical industrial environment of different disciplines such as those involving the analysis of transformer, AC and DC machine and generators.

Pre-requisite: BEJ 10103 Electric Circuits I

References:

1 Gupta, J.B. (2004). Electrical Technology. S.K. Kataria. Call number: TK146.G86 2004.
2 John Bird (2010). Electrical Circuit Theory and Technology. Newnes. TK454.B57 2010.
3 Smarajit Ghosh (2007). Fundamentals of Electrical and Electronics Engineering, 2nd ed. Eastern Economy Edition. TK145.G46 2007.
4 Azli Yusop (2007). Electrical technology: (DEE 1113). Penerbit UTHM. Call number: TK146 .A94 2007 a.
5 William D. Stanley, John R. Hackworth and Richard L. Jones (2007). Fundamentals of Electrical Engineering and Technology. Thomson Delmar Learning. Call number: TK145.S72 2007.
6 Charles K. Alexander and Matthew N. O. Sadiku (2013). Fundamentals of Electric Circuits. Mc Graw-Hill. Call number: TK454 .A43 2013.
7 Wildi, Theodore (2006). Electrical Machines, Drives and Power Systems. Prentice Hall. Call number: TK2182 .W54 2006, TK2182 .W54 2002.
8 Chapman S.J. (2002). Electric Machinery and Power System Fundamentals. McGraw-Hill. Call number: TK2000 .C462 2002.
9 Hughes Edward (2005). Electrical and Electronic Technology. Prentice Hall. Call number: TK146 .H83 2005, TK146 .H83 2002.

BEJ 20503 Control Systems

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

Pre-requisite: BEE 11203 Ordinary Differential Equation

References:

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

BEJ 20603 Power Systems

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

Pre-requisite: BEJ 10303 Electric Circuits I

References:

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

BEJ 20701 Electronic Engineering Laboratory I

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

References:

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

BEJ 20801 Electronic Engineering Laboratory II

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

References:

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

BEJ 30103 Electronic Communication Systems

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

References:

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

BEJ 30203 Microprocessor and Microcontroller

Synopsis:
This course is intended to introduce the concept of microprocessor and microcontroller which emphasis on software and hardware design of the microprocessor and microcontroller. The students will learn microprocessor and microcontroller architectures, write programming code applications and learn how to verify it using debugging software before the implementation on the real hardware.

References:

1 Yiu, Joseph (2011). The definitive guide to the ARM Cortex-MO. London: London: Newnes. Call number: TK7895.E42 .Y584 2011.
2 Yiu, Joseph. (2014). The definitive guide to ARM Cortex-M3 and Cortex-M4 processors. Amsterdam: Elsevier. Call number: QA76.5 .Y585 2014.
3 Hohl, William (2009). ARM assembly language: fundamentals and techniques. Boca Raton: CRC Press. Call number: QA76.73.A8 .H63 2009.
4 Toulson, Rob (2012). Fast and effective embedded systems design: applying the ARM mbed. Boston, MA: Elsevier. Call number: TK7895.E42 .T68 2012.
5 Andrews, Jason R. (2005). Co-verification of hardware and software for ARM SoC design. Amsterdam: Elsevier. Call number: TK7874 .A54 2005.

BEJ 30303 Computer Architecture and Organization

Synopsis:
This course introduces the fundamental of computer architecture and organization as well as other related issues towards contemporary computer architecture design. It is basically introduces the general concept of computer structure and its function, performance evaluation, architectural and organizational issues with one topic for advanced computer system. The course focuses on assembly programming to demonstrate inner working of CPU architecture.

References:

1 Stallings, William (2016). Computer Organization and Architecture: Designing For Performance. QA76.9.C643 .S72 2016.
2 Upton, Eben (2016). Learning Computer Architecture with Raspberry Pi. QA76.8.R15 .L42 2016
3 Null, Linda (2015). The Essentials of Computer Organization and Architecture. QA76.9.C643 .N84 2015
4 Shiva, Sajjan G. (2014). Computer Organization, Design, and Architecture. TK7885 .S59 2014

BEJ 30403 Electronic Circuits Analysis and Design

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

References:

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

BEJ 30503 Digital Design

Synopsis:
This course aims to teach fundamental concepts in digital circuit design and illustrate clearly the process of digital circuit design using CAE tools. Students will learn to design, simulate and verify digital logic circuit using Hardware Description Languages (HDL) and implementation on Field Programmable Gate Array (FPGA) device. It mostly focuses on gate-level designs, however will also extend the teaching to Register Transfer Level (RTL) design for creating larger logic devices. The course emphasises on writing HDL code and handling CAE tools for FPGA device that is popular for digital hardware implementation nowadays.

Pre-requisite: BEJ 10603 Digital Electronics

References:

1 Stephen Brown and Z. Vranesic. Fundamentals of Digital Logic with Verilog Design, 3rd Ed., McGraw-Hill, 2012
2 Frank Vahid. Digital Design. 2nd Ed. John Wiley, 2007. TK7888.3 .V33 2007.
3 Michael D. Ciletti. Advanced digital design with the Verilog HDL. 2nd Ed. Prentice Hall. 2011. TK7868.D5 .C54 2011
4 Frank Vahid. Digital design with RTL design, VHDL and Verilog. 2nd Edition. Wiley. 2011. TK7868.D5 .C54 2011.
5 Ronald J. Tocci, Neal S. Widmer, and Gregory L. Moss. Digital Systems: Principles and Applications. 11th Ed. Pearson Prentice-Hall. 2011. TK7868.D5 .T62 2011.
6 M. Morris Mano. Digital Design. 4th Ed. Prentice-Hall. 2007. TK7888.3 .M36 2007.

BEJ 30603 Digital Signal Processing

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

Pre-requisite: BEJ 20203 Signals and Systems

References:

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

BEJ 30701 Engineering Practices

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

References:

1 J Theodore Wildi. Electrical Machines, Drives, and Power Systems, 6th Ed., Pearson Education International, 2006. Call Number TK2182 .W54 2006
2 Dugan Roger C, McGranaghan M F, Santoso S and Beaty H Wayne. Electrical Power Systems Quality, 3rd Ed., McGraw-Hill, 2012. Call Number TK1010 .E43 2012
4 T. A. Short. Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006. Call Number TK3091 .S56 2006
5 N. S. Nise. Control Systems Engineering, 6th Ed. John Wiley, 2011. Call number: TJ213 .N57 2011
6 R. C. Dorf and R. H. Bishop. Modern Control Systems, 11th Ed. Prentice Hall, 2008. Call number: TJ216 .D67 2008
7 Ruzairi Abdul Rahim, Asas pengawal logik boleh atur cara (PLC), Penerbit UTM, 2010. Call number: TJ223 .R89 2010
8 Kamel, Khaled. Programmable Logic Controllers: Industrial Control, McGraw-Hill, 2014 Call number: TJ223.P76 .K35 2014

BEJ 30801 Electronic Engineering Laboratory III

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

References:

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

BEE 32205 Industrial Training

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

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

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

BEE 40401 Electronics Engineering Laboratory IV

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

References:

1 Dean, Alexander G., “Embedded Systems Fundamental with ARM Cortex-M Based Microcontrollers: A Practical Approach”, ARM Education Media, 2017. Call Number: TK7895.E421. D43 2017.
2 Yiu, Joseph, “The Definitive Guide to ARM Cortex-M3 and Cortex-M4 Processors”, 3rd Ed., Elsevier, 2014. Call Number: QA76.5. Y585 2014.
3 Toulson, Rob, “Fast and Effective Embedded Systems Design: Applying the ARM Embed”, Elsevier, 2012, Call Number: TK7895.E42. T68 2012.
4 Stallings, William, “Computer Organization and Architecture: Designing for Performance”, Pearson Education Limited, 2016, Call Number: QA76.9.C643 .S72 2016.

BEE 40803 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 have to ensure that the designed project meets a specified needs with appropriate consideration for public health and safety, cultural, societal, project management, economy, and environmental.

References:

1 Malaysian Standard 2013, MS 1525, Code of Practice on Energy Efficiency and Use of Renewable Energy For Non-Residential Buildings
2 G. Dieter. Engineering Design, 3rd Ed. Boston: McGraw-Hill, 2013. Call Number: TA174 .D53 2013.
3 R. Birmingham, G. Cleland, R. Driver and D. Maffin. Understanding Engineering Design: Context, Theory and Practice. London: Prentice-Hall, 1997. Call Number: TA174 .U63 1997.
4 N. Cross. Engineering Design Methods, 3rd Ed. Chicester: John Wiley, 2008. Call Number: TA174 .C76 2008.
5 M. N. Horenstein. Design Concepts for Engineers, 2nd Ed. Upper Saddle River, NewJersey: Prentice Hall, 2006. Call Number: TA174 .H67 2006.
6 B. Hyman. Fundamentals of Engineering Design, 2nd Ed. Upper Saddle River, New Jersey: Prentice Hall, 1998. Call Number: TA174 .H95 1998.
7 W. Bolton. Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering. 3rd Ed, Upper Saddle River, NewJersey: Prentice-Hall, 2003. Call number: TJ163.12.B64 2003.
8 R. Jacob, D. Alexander and L. Lane. A Guidebook to Intellectual Property: Patents, Trade Marks, Copyright and Designs. 5th Ed., Sweet & Maxwell, 2004. Call number: KD1269.3.J32 2004.
8.A K. Ghosh. Introduction to Measurements and Instrumentation. New Delhi: Prentice-Hall, 2007. Call number: TA165.G46 2007.

BEE 40602 Final Year Project I

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

Pre-requisite: Student has to complete minimum 95 credit hours

References:

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

BEE 40704 Final Year Project II

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

Pre-requisite: BEE 40602 Final Year Project I

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

SYNOPSIS OF SPECIALISATION COURSES
(COMMUNICATION ENGINEERING)

BEJ 31103 Electromagnetic Wave Propagation

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

Pre-requisite: BEJ 20303 Electromagnetic Fields and Waves

References:

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

BEJ 31202 Data Communication Network

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

References:

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

BEJ 41103 Digital Communication

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

References:

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

BEJ 41203 Wireless and Mobile Communication

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

References:

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

BEJ 41303 Optical Communication

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

References:

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

BEJ 41001 Communication Engineering Laboratory

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

References:

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

ELECTIVE SPECIALISATION COURSES (COMMUNICATION ENGINEERING)

BEJ 41403 Satellite Communication and Navigation

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

References:

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

BEJ 41503 Wireless Sensor and Mobile Ad-Hoc Network

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

References:

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

BEJ 41603 Antenna Theory and Applications

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

Pre-requisite: BEJ 31103 Electromagnetic Wave and Propagation

References:

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

BEJ 41703 Electromagnetic Compatibility

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

Pre-requisite: BEJ 31103 Electromagnetic Wave and Propagation

References:

1 H.W.Ott, Electromagnetic Compatibility Engineering, John Wiley and Sons, New Jersey, 2009. Call Number: TK7867.5.O867 2009.
2 R. Paul, Introduction to Electromagnetic Compatibility, 2nd Ed, John Wiley Interscience, New Jersey, 2006. Call number: TK7867.5.P38 2006.
3 S. M. Wentworth, Fundamentals of Electromagnetics with Engineering Applications, John Wiley and Sons, New Jersey, 2005. Call number: TK146.W46 2005.
4 C.A Balanis, Antenna Theory: Analysis and Design, 3rd Edition, John Wiley and Sons, New Jersey, 2005. Call number: TK7871.6.B34 2005.
5 V. P. Kodali, Engineering Electromagnetic Compatibility (Principles, Measurements Technologies and Computer Models), 2nd Ed., IEEE Press, New York, 2001. Call number: TK7867.5.K62 2001 N1.

BEJ 41803 RF and Microwave Engineering

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

Pre-requisite: BEJ 31103 Electromagnetic Wave and Propagation

References:

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

SYNOPSIS OF SPECIALISATION COURSES
(COMPUTER ENGINEERING)

BEJ 32103 Data Structures and Algorithm

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

References:

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

BEJ 32202 Operating Systems

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

References:

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

BEJ 42103 Computer Networks

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

References:

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

BEJ 42203 Embedded Systems Design

Synopsis:
This course introduces the architecture and design of embedded systems by developing the underlying knowledge and skills appropriate to today’s embedded systems covering hardware and software development. Topics include embedded platforms, co-design methodology, embedded operating systems, embedded interfaces, system integration and embedded system testing and debugging techniques.

References:

1 Tammy Noergaard, Embedded systems architecture: a comprehensive guide for engineers and programmers, Oxford: Newnes, 2013. Call Number: TK7895.E42 .N63 2013
2 Kim H. Pries, Testing complex and embedded systems, Boca Raton, FL: CRC Press, 2011. Call Number: TK7895.E42 .P74 2011
3 Ron Sass, Embedded systems design with platform FPGAs: principles and practices, Boston: Morgan Kaufmann, 2010. Call Number: TK7895.E42 .S27 2010
4 Steve Heath, Embedded systems design, 2nd ed. Oxford: Newnes, 2003. Call Number: TK7895.E42 .H42 2003

BEJ 42303 Software Engineering

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

References:

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

BEJ 42001 Computer Engineering Laboratory

Synopsis:
In this subject the student will be exposed to a number of experiments in implementing the theory learnt in Computer Networks and Advanced Microcontroller subjects. This includes designing and simulating systems and analyzes the work performance.

References:

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

ELECTIVE SPECIALISATION COURSES (COMPUTER ENGINEERING)

BEJ 42403 Computer System Engineering

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

References:

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

BEJ 42503 Advanced Microcontroller

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

References:

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

BEJ 42603 VLSI System Design

Synopsis:
The course covers theory and techniques of very large scale integration (VLSI) system design in complementary metal oxide semiconductor (CMOS) technology. Students will be exposed to the fundamental of CMOS logic circuits, layout, fabrication and characterization as well as the crucial parameters to be considered in any VLSI system design.

References:

1 N. H. E. Weste and D. Hariis, CMOS VLSI design: a circuits and systems perspective. 4th ed. Addison Wesley, 2010. Call Number: TK7874 .W474 2011.
2 J. P. Uyemura, Chip design for submicron VLSI: CMOS layout and simulation. Thompson, 2006. Call Number: TK7871.99.M44 .U934 2006.
3 M. Michael Vai, VLSI Design. United State of America: CRC Press, 2001. Call Number: TK7874.75 .V34 2001.
4 S. –M. Kang and Y. Leblebici, CMOS Digital Integrated Circuits Analysis & Design. 3rd ed. McGraw-Hill, 2002. Call Number: TK7871.99.M44 .K36 2003.
5 W. Wolf, Modern VLSI Design Systems and Silicon. United State of America: Prentice Hall, McGraw-Hill, 1998. Call Number: K7874.65 .W64 1998.

BEJ 42703 Computer Security

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

References:

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

BEJ 42803 Artificial Intelligence

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

References:

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

BEJ 42903 Image Processing

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

References:

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

SYNOPSIS OF SPECIALISATION COURSES
(MECHATRONIC AND ROBOTIC ENGINEERING)

BEJ 34103 Industrial Automation System

Synopsis:
Student will be introduced to actuator in automation system, industrial sensors, ladder diagram, pneumatic control circuit, motor control circuit, sequential process control design, Programmable Logic Control and manufacturing control system.

References:

1 J. Stenerson, Industrial Automation and Process Control, Upper Saddle River, NJ: Prentice Hall, 2003. Call number: TS156.8 .S73 2003.
2 M. P. Groover, Automation, Production Systems, and Computer Integrated Manufacturing, 2 nd Edition, Upper Saddle River, NJ: Prentice-Hall, 2001. Call number: TS183 .G76 2001.
3 W. Bolton, An Introduction: Programmable Logic Controller, 3rd Edition, Oxford Newnes, 2003. Call number: TJ223 .B64 2003.
4 J. R. Hackworth, F. D. Hackworth, PLC: Programming Methods and Application, Pearson Education, 2004.Call number: TJ223.P76 .H32 2004.
5 F. D. Petruzella, Programmable logic controllers, 3rd Edition, McGraw Hill, 2005. Call number: TJ223.P76 .P47 2005.
6 J.A. Rehg, Industrial electronics, Upper Saddle River, NJ: Pearson, 2006. Call number: TK7881 .R43 2006.

BEJ 34202 Vision Systems

Synopsis:
This course covers theoretical foundations of computer vision. By formulating computer vision as a statistical inference process, computational approaches to vision are presented and analyzed systematically. Chapter 1 presents introduction to computer vision. Chapter 2 and 3 provides introduction to cameras and its parameters. Chapter 4 presents about segmentation process. Chapter 5 covers about noise removal techniques. Chapter 6 elaborate about image features. Chapter 7 discuss about various method for object recognition. Finally, Chapter 8 gives an overview about stereo vision system.

References:

1 D. A. Forsyth and J. Ponce, Computer Vision: A Modern Approach, Prentice Hall, 2003. Call number: TA1634 .F67 2003.
2 R. C. Gonzalez and R. E. Woods, Digital Image Processing, 3rd Edition, Prentice Hall, 2002. Call number: TA1632 .G66 2008.
3 K. P. H. Berthold, Robot Vision, 12nd Edition, MIT Press, 1998. Call number: TJ211.3 .H67 1986.
4 E. Trucco and A. Verri, Introductory Techniques for 3-D Computer Vision, Prentice Hall, 1998. Call number: TA1634 .T78 1998.

BEJ 44103 Intelligent Control Systems

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

References:

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

BEJ 44203 Robotic Systems

Synopsis:
This subject is about learning the basic concepts of robotic systems and their classifications. It also involves the concept of forward kinematics, inverse kinematics, motion kinematics, dynamics, path planning and control systems of robotics. The operational principles and usage of drive system and sensors in the robotic systems. The technique of basic robot programming and trajectory planning.

References:

1 Spong, M. W., Hutchinson, S. and Vidyasagar, M., Robot Dynamics and Control. John Wiley & Sons, 2006.
2 Man Zhihong, Robotics, Prentice Hall, 2005.
3 Craig, J. J. Introduction to Robotics: Mechanics and Control. Addison Wesley, 1989.
4 Siciliano, B., Sciavicco, L., Villani, L., Oriolo, G., Robotics: Modelling, Planning and Control, Springer, 2009.
5 Saha, S. K., Introduction to Robotics (second edition), Tata McGraw-Hill Education, 2014.

BEJ 44303 Real Time Embedded Systems

Synopsis:
The course is designed to teach students how to apply real-time theory to the embedded systems. It is also intended to provide a balance of fundamental theory, review of industry practice, and practical experience for students preparing for a career in the real-time embedded system industries. Throughout this course, student will explore and learn hard and soft real-time concepts and terminology, application example of real-time systems in mechatronics, overview of embedded controller, peripheral interface, concepts of Real-Time operating System (RTOS), multitasking and task scheduling, and RTOS implementation.

Pre-requisite: BEJ 10102 Computer Programming

References:

1 Jiacun Wang (2017). Real-Time Embedded Systems. TK7895.E42.W364 2017.
2 Ivan Cibrario Bertolotti and Gabriele Manduchi (2012). Real-Time Embedded Systems: Open-Source Operating Systems Perspective. TK7895.E42 B47 2012.
3 Siewert, Sam (2007). Real-time embedded components and systems. TK7895.E42 .S53 2007
4 Laplante, Philip A. (2012). Real-time systems design and analysis: tools for the practitioner. QA76.54.L36 2012

BEJ 44001 Mechatronic Engineering Laboratory

Synopsis:
Student will be introduced to actuator in automation system, industrial sensors, ladder diagram, pneumatic control circuit, motor control circuit, sequential process control design, Programmable Logic Control (PLC) and manufacturing control system.

References:

1 Smith, and A. B. Corripio. Principles and Practice of Automatic Process Control, 3rd Ed. John Wiley, 2006. Call Number: TP155.75 .S58 2006.
2 J. P. Bentley. Principles of Measurement Systems, 3rd Ed. Pearson Prentice Hall, 1995. Call Number: QC53 .B46 1995.
3 D. Johnson. Process Control Instrumentation Technology, 8th Ed. Prentice Hall, 2006. Call Number: TS156.8 .J63 2006.
4 K. Ogata. Modern Control Engineering, 5th Ed.; Prentice Hall, 2010. Call Number: TJ213 .O32 2010.
5 R. G. Gupta. Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting. McGraw Hill, 2001. Call Number: TK7870.2 .G86 2001.
6 G. K. McMillan. Process/Industrial Instruments and Control Handbook. McGraw-Hill, 1999. Call Number: TS156.8 .P76 1999.
7 Cornell. Process Instrumentation Applications Manual.McGraw-Hill, 1996. Call Number: TP155.75 .C65 1996.

ELECTIVE SPECIALISATION COURSES
(MECHATRONIC AND ROBOTIC ENGINEERING)

BEJ 44403 Manufacturing Process

Synopsis:
This course covered Material, Processes and System in Manufacturing. This course is organized in eight chapters. Chapter 1 presents an introduction and overview of manufacturing. Chapter 2 provides material properties and product attributes. Chapter 3 presents metal casting process and followed with chapter 4 which describes the shaping processes for plastic. Chapter 5 and 6 describes the metal forming and sheet metal working and material removal process respectively while chapter 7 deals with joining and assembly processes. Finally, manufacturing systems will be covered in chapter 8.

References:

1 Mikell P. Groover. Introduction to Manufacturing Processes, 1st Ed, John Wiley, 2011.
2 Mikell P. Groover. Principles of modern manufacturing, John Wiley, 2011. Call Number: TS176 .G76 2011
3 G. Mikell P. Principles of modern manufacturing, John Wiley, 2011. Call Number: TS176 .G76 2011
4 H. Guo, Z. Dunwen and T. Guoxing, Advanced Design and Manufacturing Technology I, Trans Tech Pubn, 2011. Call number: XX (134587.1).
5 R. Crowson, The Handbook of Manufacturing Engineering, New York: Taylor and Francis, 2006. Call number: TS183 .H36 2006 v.1.
6 R. Asthana, A. Kumar and N. B. Dahotre, Materials Processing And Manufacturing Science, Boston : Elsevier, 2006. Call number: TA403 .A87 2006.

BEJ 44503 Digital Control Systems

Synopsis:
This course is about the introduction of digital control system, domain-z analysis, digital control design using root locus, frequency response, state space method and pole-placement design method.

References:

1 G. F. Franklin and J. D. Powel (1998)l, Digital Control of Dynamic Systems, 3rd Edition, Addison Wesley, 1998. Call number: TJ213 .M53 F72.
2 Digital Control Engineering: Analysis and Design, M. Sami Fadali and Antonio Visioli, Elsevier, 2013. Call number : TJ223.M53 .F33 2013
3 K. Ogata (1995). Discrete-Time Control Systems, Prentice Hall Call number: QA402 .O33 1995
4 G. F. Franklin and J. D. Powell (2002). Feedback Control of Dynamic Systems, International Edition, Call number: TJ216 .F7.
5 D. Landau and G. Zito (2006). , Digital Control Systems: Design, Identification and Implementation, Springer Verlag. Call number: TJ223.M53 .L36 2006

BEJ 44603 Process Control Systems

Synopsis:
This subject is about the analysis and design of process control systems. The subject is organised in seven chapters. Chapter 1 presents an introduction to process control systems. Chapter 2 provides information regarding the control loop structures applied to process control. Chapter 3 presents mathematical modelling of selected processes. Chapter 4 treats the types of feedback controllers employed in the control loops. Chapter 5 presents the instrumentation that is used in the process control systems. Chapter 6 determines the dynamic behaviour of the closed-loop systems. Finally, Chapter 7 deals with the design of the process control systems.

References:

1 D. E. Seaborg, T. F. Edgar, D. A. Mellichamp. Process Dynamics and Control, 3rd Ed. John Wiley, 2011. Call number: TP115 .P76 2011.
2 D. Johnson. Process Control Instrumentation Technology, 8th Ed. Prentice Hall, 2006. Call number: TJ216 .D67 2008.
3 R. Coughanowr. Process Systems Analysis and Control, 2nd Ed., 2 McGraw Hill, 1991. Call number: TP155.75 .C69 1991.
4 W. L. Luyben. Process Modeling, Simulation and Control for Chemical Engineers, 2nd Ed. McGraw Hill, 1990. Call number: TP155.7 .L89 1990.
5 K. Ogata. Modern Control Engineering, 5th Ed., Prentice Hall, 2010. Call number: TJ213 .O32 2010.

BEJ 44703 Mobile Robotics

Synopsis:
This course provides a succinct overview of mobile robotics with an emphasis on mobility. It starts with general introduction to mobile robots and proceeds to break down the field into specific topics, such as locomotion, kinematics, planning and navigation. Each topic begins with more summary of the problems faced by mobile robots, then presents the most common solutions or approaches.

References:

1 S. Thrun, W. Burgard, and D. Fox, Probabilistic Robotics, The MIT Press, 2005. Call number: TJ211.T57 2005.
2 R. Siegwart, I. R. Nourbakhsh, and F. Scaramuzza, Introduction to Autonomous Mobile Robot 2 nd Edition, The MIT Press, 2011. Call number: QA76.54.L36 2011.
3 T. Braunl, Embedded Robotics: Mobile Robot Design and Application with Embedded System 3 rd Edition, Springer-Verlag Berlin Heidelberg, 2008. Call number: TJ211.415.B72 2008.

BEJ 44803 Mechatronic Mechanism

Synopsis:
This course is about the analysis and application of mechanism and machine systems that transforms input forces and movement into a desired set of output forces and movement. These essential topics in mechanism might provide students with proficient theoretical and graphical background in dealing with mechanical systems.

References:

1 Chow, V. T. (1975). Open-Channel Hydraulics, Auckland: McGraw-Hill. Call number TC175 .C56 1975.
2 Subramanya, K. (2009). Flow in Open Channels. Boston: McGraw-Hill. Call number TC175 .S92 2009.
3 Jain, S. C. (2001). Open-Channel Flow. New York: John Wiley. Call number TC175 .J34 2001.
4 French, R. H. (1985). Open-Channel Hydraulics. New York: McGraw-Hill Call number TC175 .F78 1985.
5 Sturm, T. W. (2001). Open Channel Hydraulics. Boston: McGraw-Hill Call number TC175 .S78 2001.
6 Chanson, H. (2004). The Hydraulics of Open Channel Flow: An Introduction. Amsterdam: Elsevier. Call number TC175 .C42 2004.

BEJ 44903 Instrumentation and Measurement in Oil and Gas

Synopsis:
This subject is designed to provide the students with foundation in mechanical, thermal, and chemical equipments commonly used in process plant facilities. Types of equipment include pumps, compressors, valves, heat exchangers, and process instrumentations.

References:

1 J. P. Bentley, Principles of Measurement System, 3rd Ed. Pearson Prentice Hall, 1995. Call number: QC53.B46 1995.
2 Principles of Measurement System, (Fourth Edition); J.P. Bentley, Pearson Prentice Hall, 2005.
3 R. G. Gupta, Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting, McGraw Hill, 2001. Call number: TK7870.2 .G86 2001.
4 D. Jones, and C. A. Foster, Electronic Instruments and Measurements. Prentice Hall International Edition, 1991. Call number: TK7878.4 .J66 1991.
5 D. A. Bell, Electronic Instrumentation and Measurements, 2nd Ed. Prentice Hall Career and Technology, 1994. Call number: TK7878 .B45 1994.

SYNOPSIS OF SPECIALISATION COURSES (MICROELECTRONIC ENGINEERING)

BEJ 33002 Photonic Devices

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

References:

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

BEJ 33103 Fundamental of Semiconductor

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

References:

1 D. A. Neamen (2006), An Introduction to Semiconductor Devices, McGraw-Hill. Call number: TK7871.85 .N42 2006.
2 S. M. Sze, Kwok K. Ng (2006), Physics of Semiconductor Devices, 3rdEd., John Wiley and Sons Inc. Call number:TK7871.85 .S98 2006.
3 Betty Lise Anderson and Richard L. Anderson (2005), Fundamentals of Semiconductor Devices, McGraw-Hill. Call number: TK7871.85 .A52 2005.
4 Safa O. Kasap (2006), Principles of Electronic Materials and Devices, 3rd Ed., McGraw-Hill. Call number: TK453 .K37 2006.
5 Robert F. Pierret (2002), Advanced Semiconductor Fundamentals, 2nd Ed., Prentice Hall. Call number: TK7871. 85 .P53 2003.

BEJ 43001 Microelectronic Engineering Laboratory

Synopsis:
This course introduces to strengthen and apply the theoretical knowledge in the Microfabrication by means of practical work.

References:

1 Senturia, S. D. (2001), Microsystem design. London: Kluwer Academic Published, Call number: TK7875 .S46 2001.
2 Franssila S. (2010), Introduction to Microfabrication, Willey. Call number: TK7875 .P72 2010.
3 Madou, M. J. (2002), Fundamentals of Microfabrication, The Science of Minituarization, 2 nd Ed.; Boca Raton: CRC Press, 2002. Call number: TK7836 .M32 2002.
4 Travis N. Blalock and Richard C. Jaegaer, (2004), Microelectronic Circuit Design, McGraw-Hill. Call number: TK7874 .J34 2011.

BEJ 43103 VLSI System

Synopsis:
The course will cover basic theory and techniques of very large scale integration (VLSI) system design in complementary metal oxide semiconductor (CMOS) technology. Students will be exposed with the fundamental of CMOS logic circuits, layout, fabrication and characterization as well as the crucial parameters to be considered in any VLSI system design. Students will be able to optimise and analyse the parameters involve in designing VLSI system. Students also will be introduced to Computer Aided Engineering (CAE) design tools to help in designing VLSI circuit.

Pre-requisite: BEJ 30503 Digital Design

References:

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

BEJ 43203 Microfabrication

Synopsis:
This course describes the microfabrication technology for integrated circuit particularly for transistor devices. Microfabrication processes such as oxidation, photolithography, diffusion, etching, metallization and characterization will be discussed with related to the current and latest technology.

References:

1 Franssila S. (2010), Introduction to Microfabrication, Willey. Call number: TK7875 .P72 2010.
2 Madou, M. J. (2002), Fundamentals of Microfabrication, The Science of Minituarization, 2nd Ed.; Boca Raton: CRC Press, 2002. Call number: TK7836 .M32 2002.
3 Travis N. Blalock and Richard C. Jaegaer, (2004) Microelectronic Circuit Design, McGraw-Hill. Call number: TK7874 .J34 2011.
4 Peter Van Zant, Microchip Fabrication a Practice Guide to Semiconductor Processing (2000), McGraw Hill. Call number: TK7871.85 .V36 2002.
5 Jackson, (2005) Microfabrication & Nanomanufacturing, CRC. Call number: TK7836 .M52 2005.

BEJ 43303 Advanced Semiconductor Devices

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

Pre-requisite: BEJ 33103 Fundamental of Semiconductor

References:

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

ELECTIVE SPECIALISATION COURSES (MICROELECTRONIC ENGINEERING)

BEJ 43403 MEMS Technology

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

References:

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

BEJ 43503 IC Packaging

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

References:

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

BEJ 43603 Material Characterization

Synopsis:
This course introduces the surface and material characterisation techniques related to bonding surface. Surface analysis is use of microscopic associated to the optical, chemical and physical probes that give information about the surface region of a sample. Most of the techniques used probe surface utilized the electrical measurements setup, emission and absorption spectroscopy analysis and as well as the nature electromagnetic radiation. The basic concept of reliability concern and failure analysis of a semiconductor sample is also introduced that deals with the sample preparation, electrostatic discharge mechanism and electromigration.

References:

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

BEJ 43703 Nanoelectronic Devices

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

References:

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

BEJ 43803 Reliability and Testability in IC Device

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

References:

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

SYNOPSIS OF SPECIALISATION COURSES
(MEDICAL ELECTRONIC ENGINEERING)

BEJ 35103 Human Physiology

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

References:

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

BEJ 35202 Medical Equipment Management and Safety

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

References:

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

BEJ 45001 Medical Electronics Engineering Laboratory

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

References:

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

BEJ 45103 Medical Imaging

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

References:

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

BEJ 45203 Principle of Physiological Devices

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

Pre-requisite: BEJ 35103 Human Physiology

References:

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

BEJ 45303 Medical Instrumentation

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

Pre-requisite: BEJ 35202 Medical Equipment Management and Safety

References:

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

ELECTIVE SPECIALISATION COURSES
(MEDICAL ELECTRONIC ENGINEERING)

BEJ 45403 Telemedicine System and Applications

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

References:

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

BEJ 45503 Biomedical Optics

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

References:

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

BEJ 45603 Biomaterial

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

References:

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

BEJ 45703 Biomedical Engineering and Applications

Synopsis:
Introduction to biomedical engineering, rehabilitation engineering, instrumentasion and technology and biomedical engineering applications in diagnostic, monitoring and special area of heathcare system.

References:

1 John D. Enderle, Joseph D. Bronzino (2012). Introduction to Biomedical Engineering. Academic Press, 2012. Call Number: R856.I57 2012.
2 AzzamTaktak, Paul Ganney, David Long and Paul White (2014). Clinical Engineering: A Handbook for Clinical and Biomedical Engineers. Academic Press, 2014. Call Number: R856.15.C54 2014
3 Andrew W. Wood (2012). Physiology, Biophysics, and Biomedical Engineering. CRC Press, 2012. Call Number: R895.E66 2012
4 James Moore, George Zouridakis (2014). Biomedical Technology and Devices Handbook. Boca Raton: CRC Press, 2014. Call Number: R856.15 .B57 2014.
5 Bernhard 0. Palsson and Sangeeta N. Bhatia (2004). Tissue Engineering. Pearson Prentice Hall Bioengineering, 2004. Call Number: R856.P34 2004
6 Romuald S. Wadas (1991). Biomagnetism. Ellis Horwood, Call Number: QH 504.W33 1991.
7 Brozino, Joseph D. (2000). The biomedical engineering handbook. Boca Raton, FL : CRC Press, 2000. Call Number: R856 .B56 2000.
8 Ann Saterbak, Ka-Yiu San, Larry V. McIntire (2007). Bioengineering Fundamentals. Upper Saddle River, NJ : Pearson, 2007. Call Number: TA164 .S27 2007
9 Jack M. Winters, Molly Follette Story (2007). Medical Instrumentation: Accessibility and Usability Considerations. Boca Raton: CRC Press, 2007. Call Number: R856.6 .M42 2007
10 J Laurence J. Street (2008). Introduction to Biomedical Engineering Technology. Boca Raton, FL : CRC, 2008. Call Number: R856 .S77 2008
11 Muhammad Mahadi Azxxbdul Jamil (2015). Introduction to Biomedical Engineering: Research Projects and Case Studies.Penerbit UTHM, 2015.

BEJ 45803 Rehabilitation System Engineering

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

References:

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

BEJ 45903 BioMEMS and Medical Microdevices

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

References:

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

SYNOPSIS OF SPECIALISATION COURSES
(IR4.0)

BEE 40903 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

BEE 41003 Data Science and Applications

Synopsis:
This course provides a concept of data mining to provide meaningful information from large amounts of complex data using various tools, algorithms and machine learning principles. It is applicable to all current megatrends from social to mobile to the cloud to AI. It is crucial for a Data Scientists to be able to transform data into strategic business decisions, value-driven products, and lead predictions. Students will learn on how to leverage unstructured real data to unlock new economic value for business, as well as apply useful data science concepts to every aspect of daily life from personal finances, to reading, lifestyle habits, and work decisions. This course is suitable for various electrical and electronics engineering application through the processes of gathering, cleaning and handling data from data driven into machine driven.

References:

1 Alpaydin, Ethem. Introduction to machine learning 2nd ed. Cambridge, Mass. : MIT Press, 2010.Call Number: Q325.5 .A46 2010
2 Critchlow, Terence Data-intensive science, 2013. Call Number: Q183.9 .D37 2013
3 Mohanty, Soumendra. Big data imperatives : enterprise big data warehouse, BI implementations and analytics. New York : Apress, 2013. Call Number: QA76.9.D32 .M63 20
4 Jure Leskovec, Anand Rajaraman, and Jeffrey David Ullman (2014). Mining of Massive Datasets 2nd ed., Cambridge University Press. Call Number: QA76.9.D343 .R34 2012
5 Marsland, Stephen (2009). Machine learning : an algorithmic perspective. Boca Raton, FL : CRC Press, 2009. Call Number: Q325.5 .M37 2009

BEE 41103 HCIA Routing and Switching

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

References:

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

BEE 41203 HCIA Cloud Computing

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

References:

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

BEE 41303 HCIA Artificial Intelligence

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

References:

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

UQU 40103 Professional@Work

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

References:

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

CAREER AND FURTHER EDUCATION PROSPECT

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

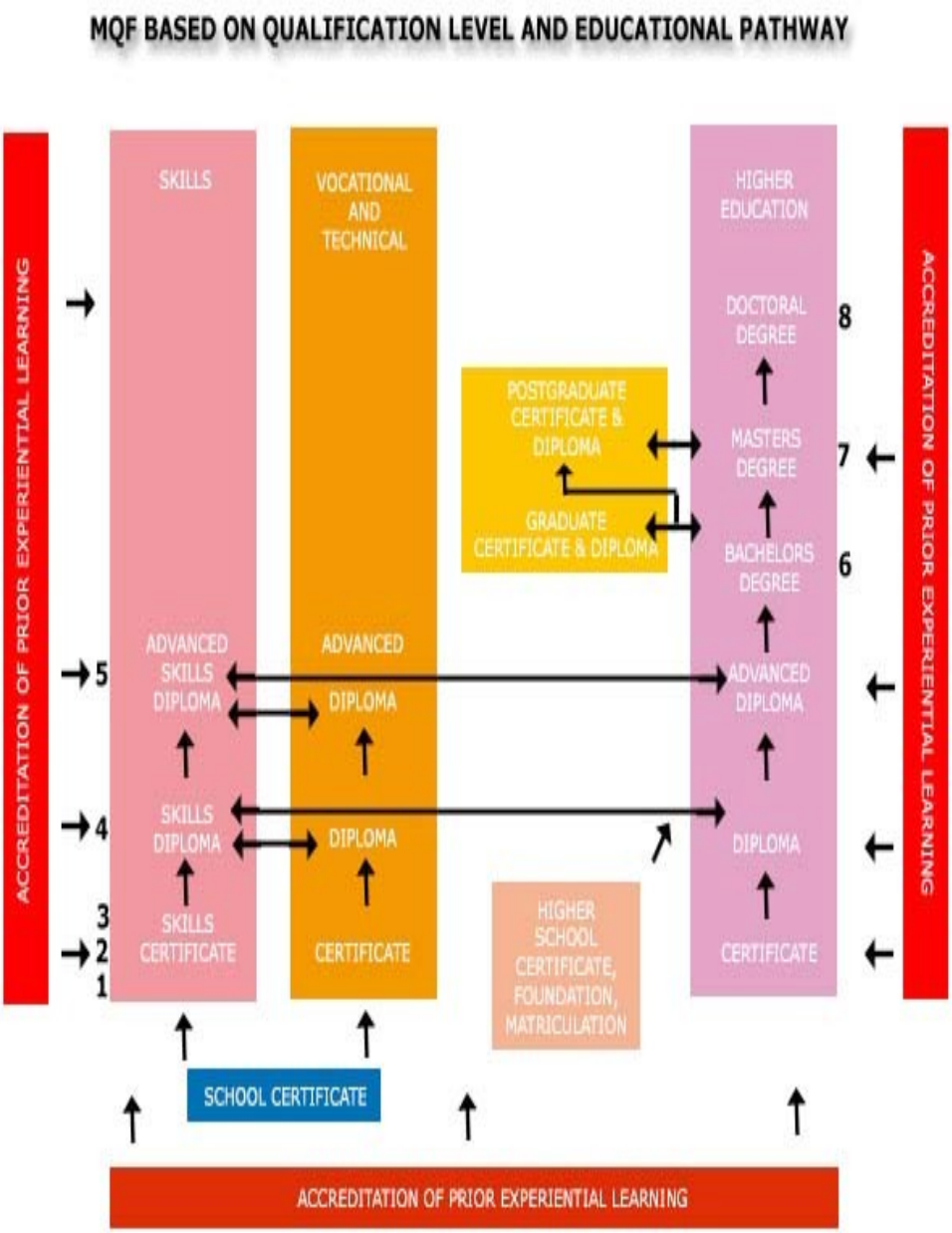
Electronic Engineering graduates play important roles in wide range of sectors such as manufacturing, research, design, development, testing, installation, commissioning and maintenance of various systems.

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

Additionally, the 5 different specialisation (Computer, Communication, Microelectronic, Mechatronic and Medical Electronic) will greatly emphasised a targeted engineering field which offers more qualified engineers at field.

Nevertheless, the room for continuing studies is always available. It is also worthwile 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).

FUTHER EDUCATION PATHWAY



MALAYSIAN QUALIFICATIONS FRAMEWORK: QUALIFICATIONS AND LEVELS

<table>
<tr><th rowspan="2">MQF Levels</th><th colspan="3">Sectors</th><th rowspan="2">Lifelong Learning</th></tr>
<tr><th>Skills</th><th>Vocational and Technical</th><th>Higher Education</th></tr>
<tr><td>8</td><td colspan="2" rowspan="4"></td><td>Doctoral Degree</td><td rowspan="9">Accreditation of Prior Experiential Learning (APEL)</td></tr>
<tr><td rowspan="2">7</td><td>Masters Degree</td></tr>
<tr><td>Postgraduate Certificate & Diploma</td></tr>
<tr><td rowspan="2">6</td><td>Bachelors Degree</td></tr>
<tr><td>Graduate Certificate & Diploma</td></tr>
<tr><td>5</td><td>Advanced Diploma</td><td>Advanced Diploma</td><td>Advanced Diploma</td></tr>
<tr><td>4</td><td>Diploma</td><td>Diploma</td><td>Diploma</td></tr>
<tr><td>3</td><td>Skills Certificate 3</td><td rowspan="3">Vocational and Technical Certificate</td><td>Certificate</td></tr>
<tr><td>2</td><td>Skills Certificate 2</td><td rowspan="2"></td></tr>
<tr><td>1</td><td>Skills Certificate 1</td></tr>
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Disclaimer:

This is a revised Faculty of Electrical and Electronic Engineering Proforma Bachelor of Electronic Engineering with Honours as of 15th September 2021 FKEE

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