POLITEKNIK MALAYSIA
TUANKU SYED SIRAJUDDIN

STUDENT HANDBOOK

JABATAN KEJURUTERAAN ELEKTRIK

Second Edition

STUDENT HANDBOOK

ELECTRICAL ENGINEERING DEPARTMENT

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Perlis

EDITORIAL COMMITTEES

FROM THE DIRECTOR

On behalf of Politeknik Tuanku Syed Sirajuddin, Perlis, I would like to welcome all new students with the hope that this would be the beginning of a wonderful journey towards fulfilling your dream.

As part of our mission to create a conducive learning environment, we take pride in providing and exposing students to various innovative teaching approaches. Guided by competent educators, you are embracing a cutting edge technology based education which empowers our future graduates with all the right ingredients to become a productive employee to any given organization.

The coming years of study would be crucial for all the students as you will be adapting yourselves to the higher learning education system, as well as new circle of social life. These challenges might be beyond your comfort zone, but eventually would help develop a wholesome being.

I urge all of you to grab the opportunities to develop your mind and self here. Expand your horizon by actively taking parts in various clubs, students' organizations, a wide spectrum of extracurricular activities, and also entrepreneurial opportunities. We would create as many platforms as possible for you to display your talents and creativity as a way to contribute to the polytechnic.

In this comprehensive hand book you will find PTSS policies and regulations regarding all the courses offered, grading system and other services available. Look through it thoroughly so that you will be well prepared to embark into a new chapter of your life. Lastly, I wish you great happiness and success in everything you do.
Thank you.

Sincerely,

DR. HAJI MOHD ZAHARI BIN ISMAIL
Director
Politeknik Tuanku Syed Sirajuddin

1.0 INTRODUCTION

Politeknik Tuanku Syed Sirajuddin is a comprehensive, learner centered higher education institution that serves its local and regional learners and their communities through high-quality and flexible education and training. It is aimed to develop student's employability skills to meet the needs of a more dynamic economy, which values innovation and productivity. Programmes include a global perspective that will enable graduates to make a valuable contribution to the wider society as it changes in response to regional and international competition and demand.

PTSS programmes include a variety of Outcome-Based Education teaching approaches, adding value to PTSS teaching and learning which cater to students seeking a quality polytechnic education and training.

The PTSS Student Handbook provides students with information on many facets of college life such as policies, procedures, and services. It is written for every student enrolled in one or more courses at PTSS.

This Handbook is aimed to guide students through the various procedural steps that lead to a Diploma study. It also provides graduate program descriptions, the requirements needed to obtain a graduate Diploma, and a clear outline of the procedural steps that students need to follow. Students are also provided with information on matters related to general administration such as student services and facilities, campus disciplinary measures, student organizations and other relevant matters.

This book serves as a preliminary guide and does not purport to completely address every policy, procedure and regulation. In addition no claim is made that this document covers all the rules and regulations in effect now at PTSS. Students must refer to the relevant PTSS Department programmes and services publications and other Departments and Units Policies for further information.

2.0 VISION & MISSION

DEPARTMENT OF POLYTECHNIC EDUCATION

VISION

To become the premier TVET institutions by industries lead

MISSION

Providing access to quality of TVET Programme and recognized

TUANKU SYED SIRAJUDDIN POLYTECHNIC

VISION

To become a superior TVET institutions by 2025

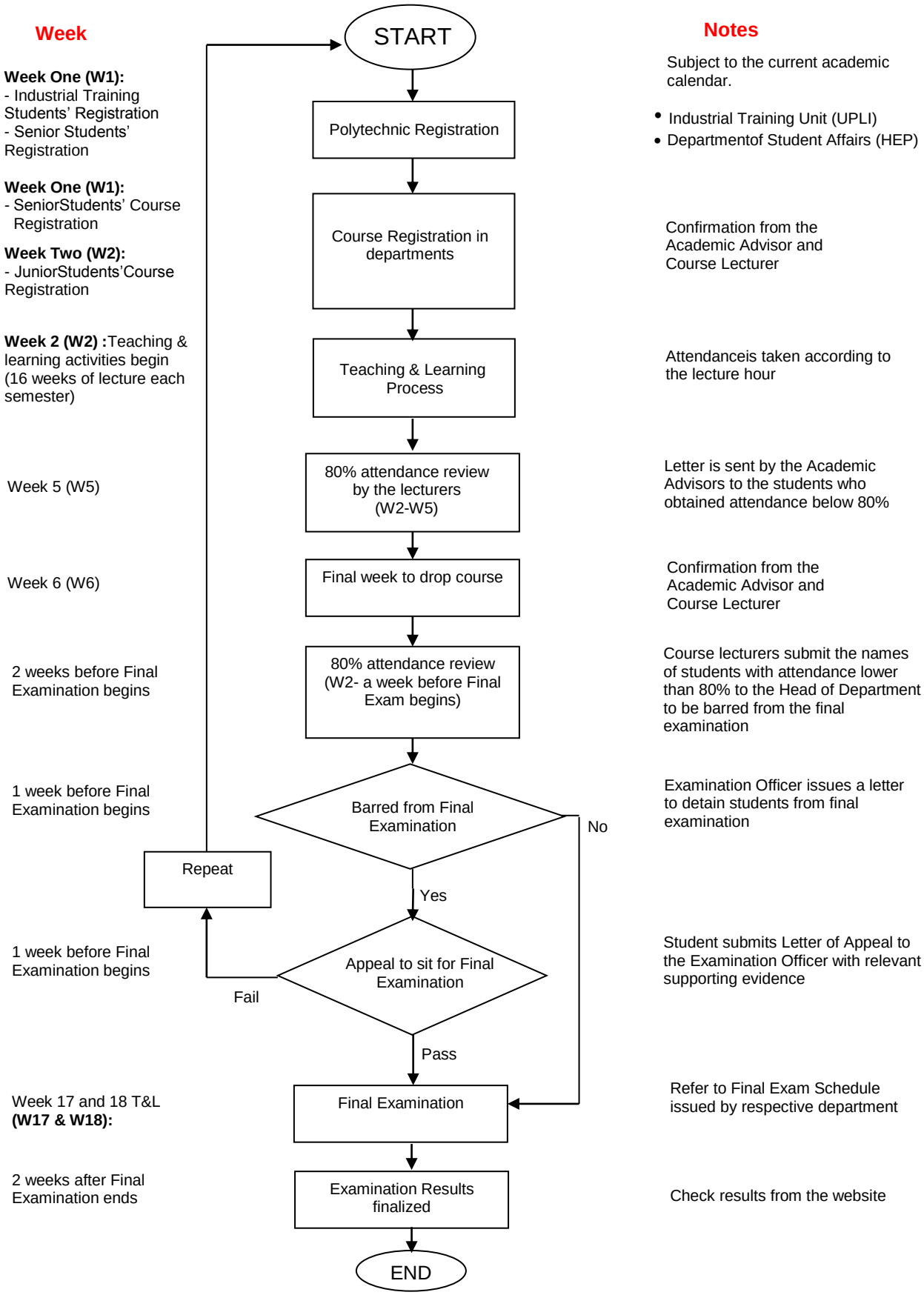
MISSION

To become a premier catalyst in producing a holistic human capital who are globally competitive.

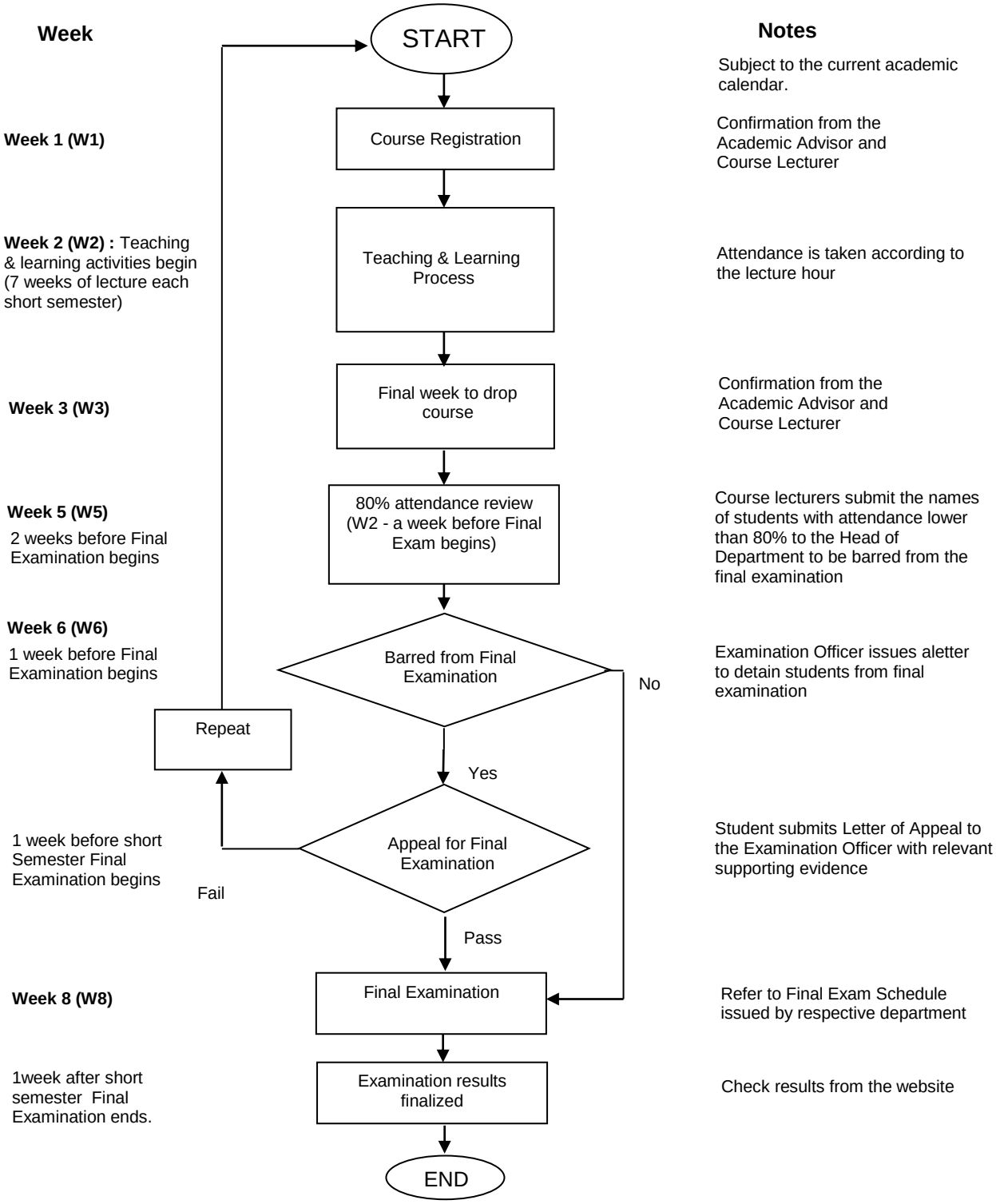
MOTTO

Knowledge drive Development

3.0 ACADEMIC FLOW CHART



3.1 ACADEMIC FLOW CHART FOR SHORT SEMESTER

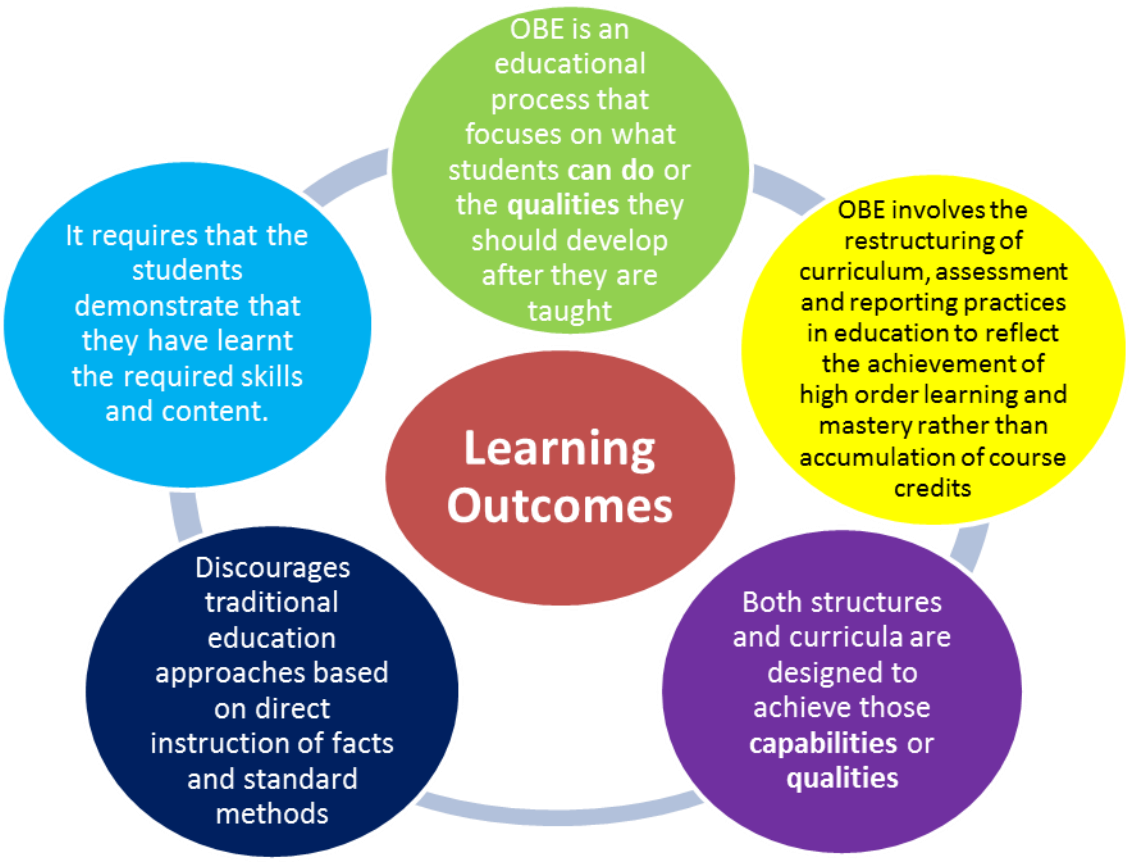


4.0 OUTCOME-BASED EDUCATION [OBE]

Outcome-based education (OBE) is an educational model for students to demonstrate their knowledge and able to perform according to the required outcomes.It is a student-centered approach that focuses on students' learning. It starts with a clear picture of what students should know, what they should be able to do, and what desireable attitudes and values needed to organize the curriculum, instruction, and assessment to ensure an ultimate learning (Spady, 1994:1). Thus, OBE involves the restructuring of curriculum and assessment that reflects achievement of high learning order and mastery learning.

OBE helps students to be aware of what they should learn, aware of what they are are learning and the control over their own learning. It leads to successful student learning and encourages lecturers to be well prepared.It also provides students with appropriate,purposefullearning experiences and opportunities for studentsto develop originality, self-motivation and independence while acquiring useful knowledge and skills.

4.1 WHAT IS OUTCOME-BASED EDUCATION [OBE]

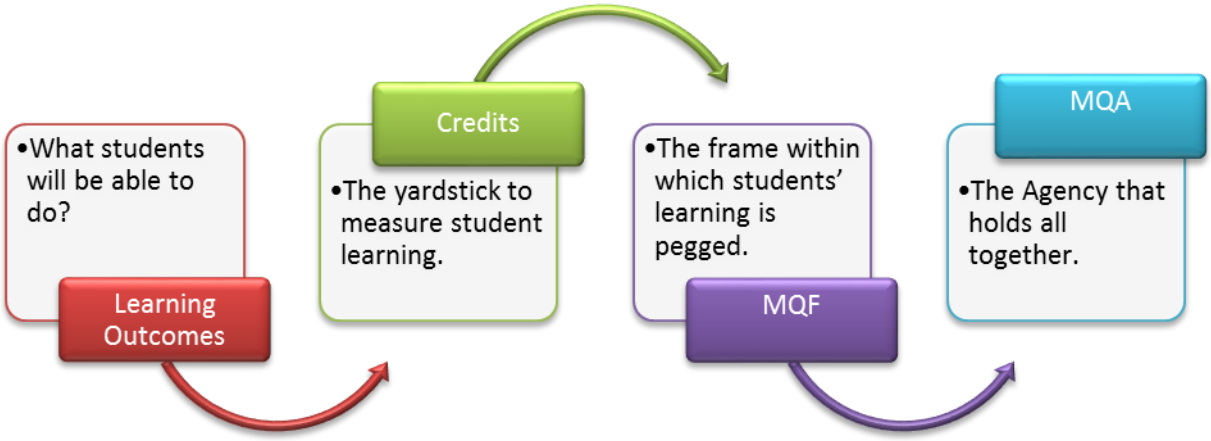


4.2 ACREDITATION PROCESS

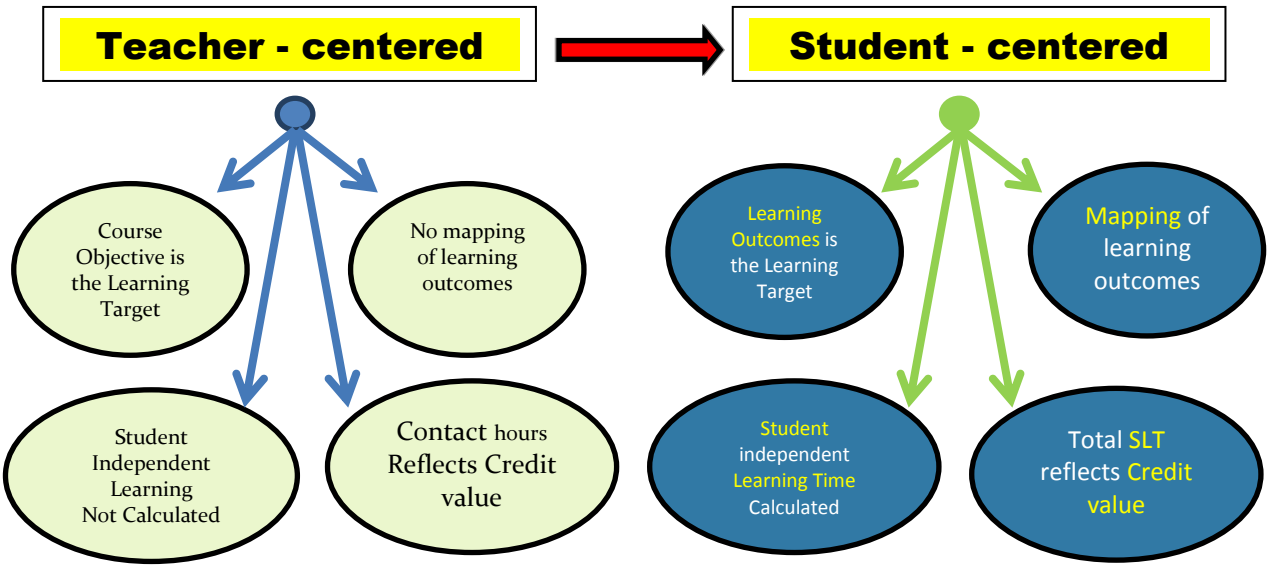
Reference Number : MQA/FA3311
Certificate Number : 10101
Name of Qualification : Diploma in Electronic (Computer)

Reference Number : MQA/FA3312
Certificate Number : 10102
Name of Qualification : Diploma in Electronic (Optoelectronic)

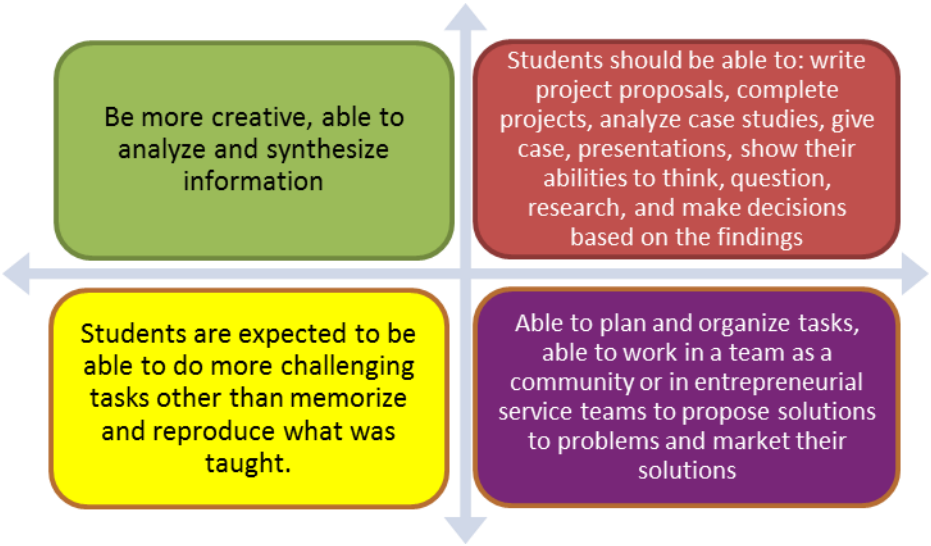
Reference Number : MQA/FA3313
Certificate Number : 09612
Name of Qualification : Diploma in Electronic (Communication)



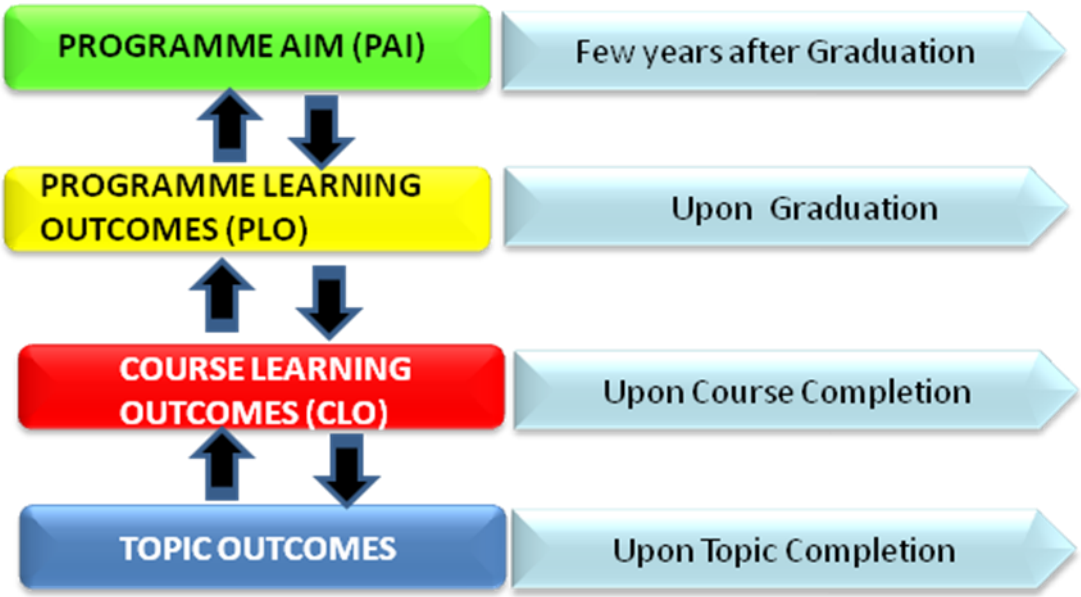
4.3 HOW DOES OBE AFFECT TEACHING-LEARNING?



4.4 EXPECTATIONS ON STUDENTS



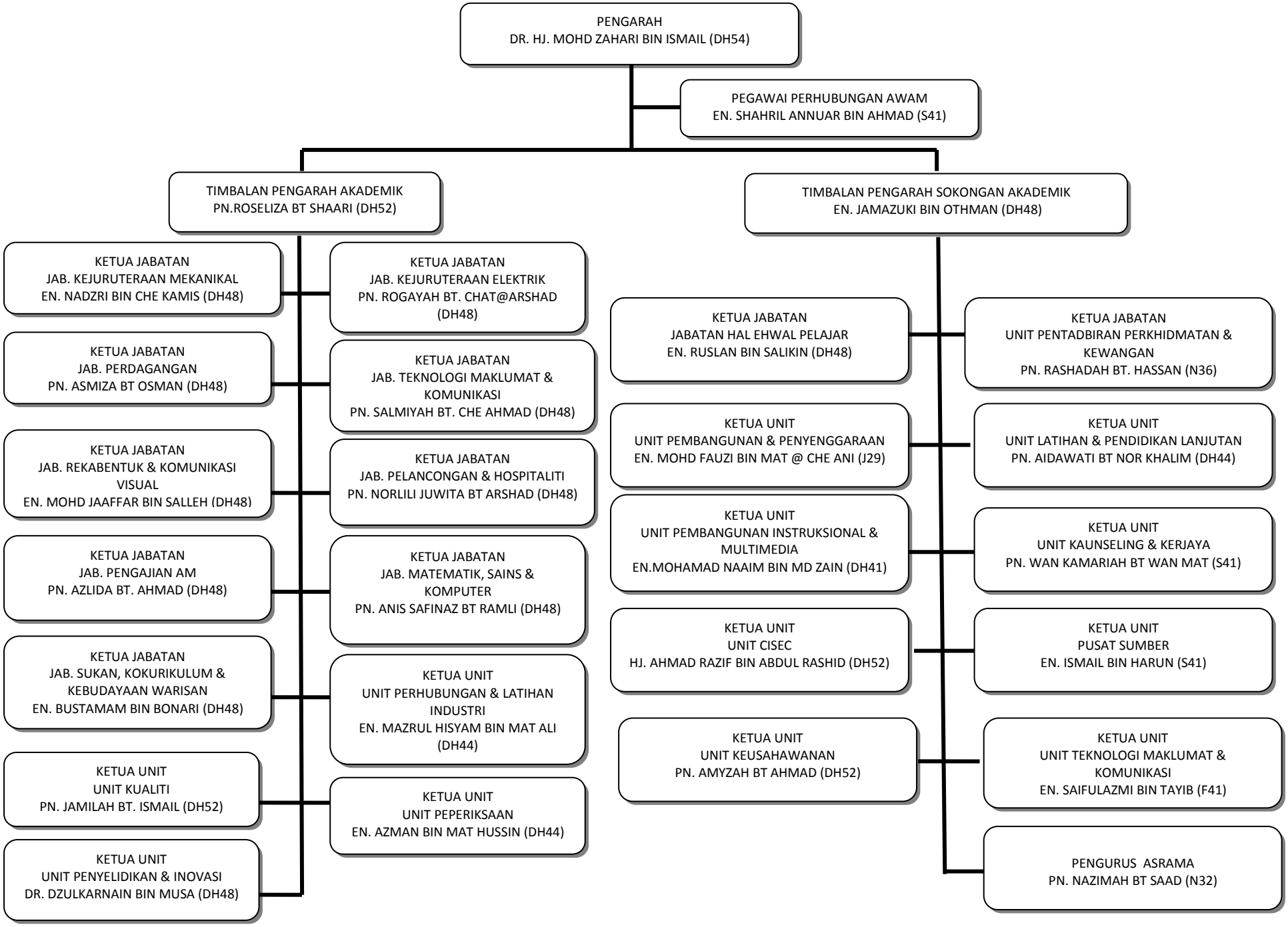
4.5 DIFFERENT LEVELS OF OBE



4.6 LEARNING DOMAIN (LD)

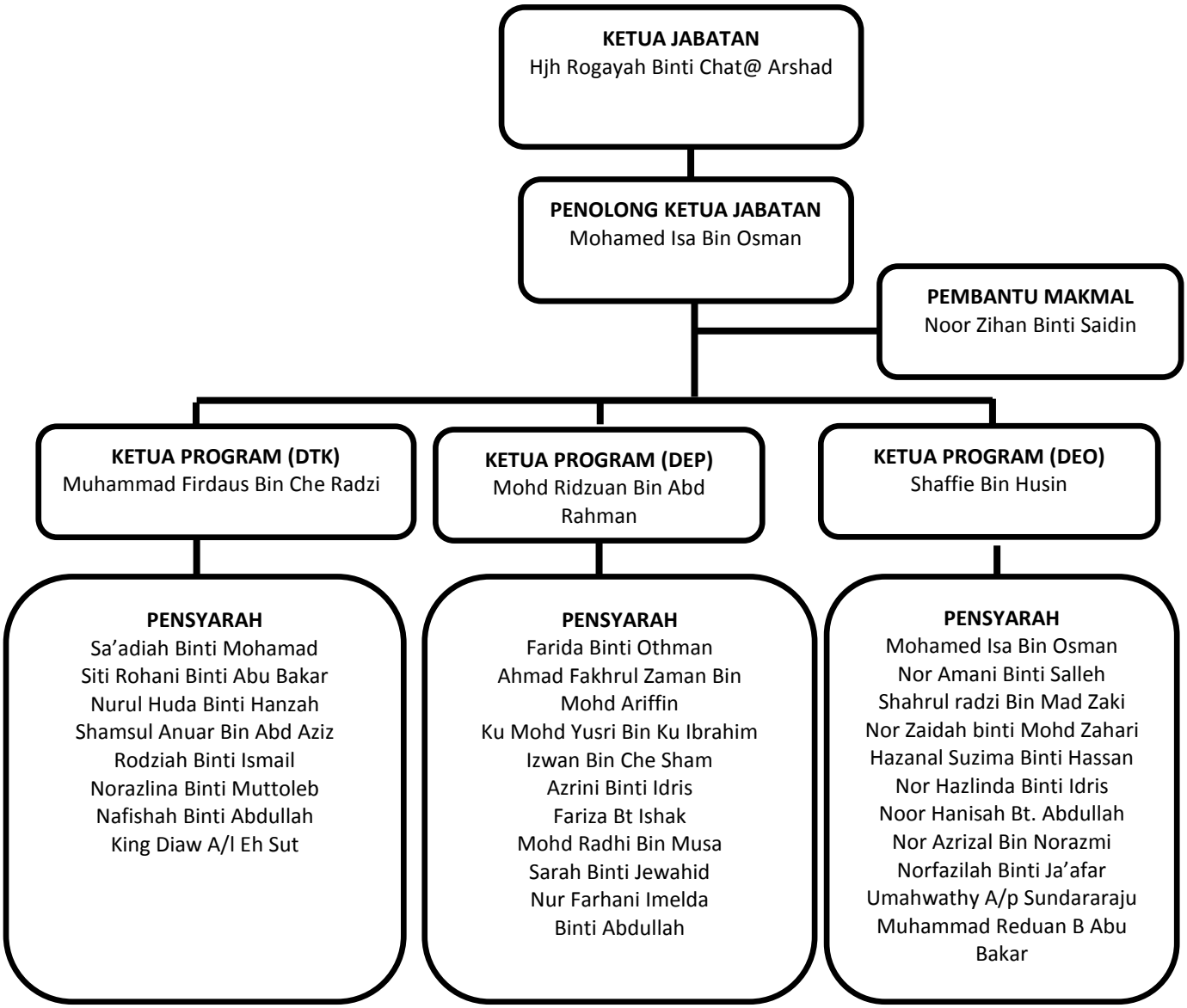
Learning Domain (LD)
LD 1 Knowledge
LD 2 Practical Skills
LD 3 Communication Skills
LD 4 Critical Thinking and Problem Solving Skills
LD 5 Social Skills and Responsibilities
LD 6 Continuous Learning and Information Management Skills
LD 7 Management and Entrepreneurial Skills
LD 8 Professionalism, Ethics and Moral
LD 9 Leadership and Teamwork Skills

5.0 MANAGEMENT ORGANISATION CHART



6.0 ELECTRICAL ENGINEERING DEPARTMENT

6.1 DEPARTMENT ORGANISATION CHART



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ELECTRICAL ENGINEERING
DEPARTMENT

COMPUTER

6.3 DIPLOMA IN ELECTRONIC ENGINEERING (COMPUTER)

6.3.1 PROGRAMME OVERVIEW

INTRODUCTION

The Diploma in Electronic Engineering (Computer) is designed to cover the current wide discipline of electronic engineering with the added specialization of electronics used in the field of computer technology. Graduates are forecast to serve in the field of computer technology and electronic engineering. The use of electronics in computer based equipment today requires skilled and trained technicians necessary for these new challenges. The Diploma in Electronic Engineering (Computer) of the Polytechnic's Ministry of Education Malaysia equips its graduates with the certified and recognized technical skills necessary in the area of specialization.

An electronic engineering diploma graduate of the Polytechnic's Ministry of Education Malaysia would have undergone a core curriculum consisting of courses in mathematics, fundamentals of electricity, electronics and solid state devices. Graduates of the electronic engineering (computer) diploma programme would have undergone specialized courses in computer architecture and organization microprocessor, database system, operating system, programming and computer system diagnosis and maintenance.

The 6 semester approach of The Diploma in Electronic Engineering (Computer) is designed to provide an electronic engineering diploma graduate with the possibility of articulating towards a career in the field of computer engineering or electronics engineering. This multidisciplinary field involves the application of the principles of engineering in solving problems in an electronic and computer based system. With the advent of computer hardware and software integration, more and more participation of technicians is being demanded in the field of computer technology. This has necessitated the birth of electronic technicians, who are able to grasp the essences of computerization with a solid background in the field of electronic engineering.

SYNOPSIS

The Diploma in Electronic Engineering (Computer) is designed to cover the current wide discipline of electronic engineering, with the added specialization of electronics used in the field of computer based technology. The broad-based electronic foundation of which includes power, telecommunication, control, instrumentation and computers provides versatility to the graduates, while emphasizing the area of specialization.

These graduates are forecast to serve in the field of computer technology. The use of electronics in computer based equipment today requires skilled and trained technicians necessary for these new challenges. The Diploma in Electronic Engineering (Computer) of the Polytechnic's Ministry of Higher Education Malaysia equips its graduates with the certified and recognized technical skills necessary in the area of specialization.

6.3.2 JOB PROSPECT

This programme provides the knowledge and skills in electronic engineering with specialization in computer. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:-

- Computer Technician
- Electronic Technician
- Technical Specialist
- Electrical, Electronic and Computer Service Technician
- Assistant Engineer
- Marketing Executive
- Self-employed

6.3.3 PROGRAMME AIM

The Diploma in Electronic Engineering (Computer) graduates in Polytechnics,Ministry of Higher Education will have the knowledge, technical skills,communication skills and attitude to adapt themselves with new technologicaladvancement and challenges in the computer and electronics field.

6.3.4 PROGRAMME EDUCATIONAL OBJECTIVES

The Diploma in Electronics Engineering (Computer) programme shall produce semi professionals who are:

1. knowledgeable and technically competent in electronics and computer disciplines and able to adapt themselves with new technological challenges in electronic and computer.
2. effective in communication and contribute effectively as a team member with the capability of being a leader.
3. capable to solve computer and electronics problems innovatively, creatively,ethically with social responsibility towards developing country and community.
4. able to demonstrate entreprenuership skills and recognize the need of lifelong learning for successful career advancement.

6.3.5 PROGRAMME LEARNING OUTCOMES

Upon completion of the programme, graduates should be able to:

1. apply technical knowledge and social science / humanities knowledge to well defined electrical and electronic engineering problem and to the personality development of individual respectively.
2. solve well-defined electrical and electronic engineering related problems systematically by applying critical thinking skill and using appropriate tools and techniques.
3. analyze and investigate well-defined electrical and electronic engineering problems.
4. design well defined engineering solutions for electrical and electronic engineering systems.
5. demonstrate practical skill in utilizing modern electrical and electronic engineering tools and design packages.
6. communicate effectively with the engineering community and the society at large.
7. demonstrate awareness and consideration for societal, health, safety, legal and cultural issues and the consequent responsibilities, taking into account the need for sustainable development.
8. engage in independent acquisition of new knowledge and skill, and recognize the need for professional development and information management.
9. demonstrate an awareness for entrepreneurship.
10. demonstrate an understanding of professional ethics, responsibilities and norms of electrical and electronic engineering practices.
11. function individually or in teams, effectively, with a capability to be a leader.

6.3.6 SYNOPSIS AND COURSE LEARNING OUTCOME (DTK)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
1	DET1013 Electrical Technology	ELECTRICAL TECHNOLOGY introduces students to the principles of DC electrical circuits. It covers the fundamental laws, theorems and circuit techniques. This course also covers magnetic and electromagnetic circuits. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. Apply the concept and principles of DC electrical circuit using different method and approach. (C3, PLO1) 2. Solve DC circuit problems using appropriate DC electrical laws and theorems. (C3, PLO2) 3. Conduct the laboratory activities of DC electrical circuit using appropriate electrical equipment. (P4, PLO5) 4. Demonstrate ability to work in team to complete assigned task during practical work sessions. (A3, PLO11)
1	DET1022 Electrical Wiring	ELECTRICAL WIRING course exposes students to the aspects of wiring installation. Students will be able to relate theoretical aspect in practical work on electrical wiring during workshop sessions. This course provides the students with the knowledge and skill in doing different types of wiring installation, inspection and testing **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the concept and principles of electrical safety and wiring in electrical wiring according to NIOSH and MS IEC 60364. (C3, PLO1) 2. Solve problems related to single-phase domestic wiring failure according to MS IEC 60364. (C3, PLO2) 3. Construct single-phase domestic wiring, wiring inspection & testing, and wiring protection according to MS IEC 60364. (P4, PLO5) 4. Demonstrate understanding of engineering norms and practices in electrical wiring during practical work sessions. (A3, PLO10)
1	DEE1012 Measurement	MEASUREMENT introduces students to the basic concept of electrical instrument and measurement. It covers the basic principles of measurement, safety precautions and meter calibration. Students will also use measurement devices such as analogue meters, DC and AC meters, analogue and digital multimeters, oscilloscopes, signal generators and power meters during practical session. This course also covers the basic concept and simple application of DC Bridge. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the concept of measurement principles and measuring equipment in electrical and electronic measurement. (C3, PLO1) 2. Solve problems of electrical and electronic circuit using appropriate measuring operations and theorems. (C3, PLO2) 3. Perform meter calibrating and measuring technique using the correct measuring equipment. (P4, PLO5) 4. Demonstrate good written communication skill through essay writing in a group on assigned topics within a stipulated time frame. (A3, PLO6)

1	DUW1012 Occupational Safety And Health	OCCUPATIONAL SAFETY AND HEALTH course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of employers and employees in implementing and complying with the safety procedures at work. This course provide an understanding of the key issues in OSH management, incident prevention, Emergency Preparedness and Response (EPR), fire safety, occupational first aid, Hazard Identification, Risk Assessment and Risk Control (HIRARC) and guide the students gradually into this multi-disciplinary science. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Identify the OSH legislation and its compliance in Malaysia. (C2, LD1) 2. Explain briefly incident hazards, risks and safe work practices in order to maintain health and safe work environment. (C2, LD1) 3. Discuss cooperatively in responding to an accident action at workplace. (C3,LD1; A2,LD4) 4. Adhere to the safety procedures in respective fields. (A3, LD8)
2	DET2033 Electrical Circuits	ELECTRICAL CIRCUITS designed to provide students with the knowledge of electrical circuits. It emphasizes the principles of an alternating current AC waveform and sinusoidal steady-state circuit analysis. This course also covers the applications of three phase system and operation of various types of transformers. **CREDIT(S) : 3** **PREREQUISITE(S) : DET1013 ELECTRICAL TECHNOLOGY**	1. Apply the concept and principles of AC electrical circuit and their analysis using AC circuit law. (C3 , PLO1) 2. Solve problems of AC electrical circuit using the appropriate AC electrical laws and theorems. (C3 , PLO2) 3. Conduct the laboratory exercises of AC electrical circuit using appropriate Electrical equipments. (P4 , PLO5) 4. Demonstrate ability to work in team to complete assigned tasks during practical Work sessions. (A3 , PLO11)
2	DEE2023 Semiconductor Devices	SEMICONDUCTOR DEVICES is an introduction to the basic electronic theories and devices. The course covers the fundamentals of electronic devices which includes diodes, bipolar junction transistors and field effect transistors. The content encompasses devices structure to biasing basic applications. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. Apply the concept and principles of theoretical characteristics and electrical properties of semiconductor devices. (C3, PLO1) 2. Solve problems of semiconductor devices application circuits related to the operation and the characteristics of the circuits. (C3, PLO2) 3. Construct and test the various applications of semiconductor devices circuit Based on schematic diagrams. (P4, PLO5) 4. Demonstrate good communication skill in oral presentation individually or in group, on assigned topics within a stipulated time frame. (A3, PLO6)

2	DEE2034 Digital Electronic	DIGITAL ELECTRONICS introduces the theories on the basic of digital systems. This course emphasizes on the digital system fundamentals and applications. This course mainly covers number systems, code systems, logic gates, Boolean operations, combinational circuits, flip-flops, counters and registers. **CREDIT(S) : 4** **PREREQUISITE(S) : NONE**	1. apply the knowledge of various number systems codes , logic operations and logic gates in digital systems. (C3, PL01) 2. design combinational or sequential logic circuits using Boolean Algebra or Karnaugh Map. (C5, PLO4) 3. manipulate the design of logic diagrams, truth tables and timing diagrams for logic gates and flip-flops and implement them in combinational and sequential logic circuits . (P4, PLO5)
2	DEC2012 Fundamental Programming	FUNDAMENTAL PROGRAMMING course provides the skills necessary for the effective of application of computation and computer programming in engineering applications. Students will develop their programming skills through a variety of assignments and labs and by reviewing case studies and example programs. The learning outcome is proficiency in writing small to medium programs in a procedural programming language. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply knowledge of basic concepts and fundamentals of structured programming. (C3, PLO1) 2. solve a variety of engineering and scientific problems using a high level programming language and apply critical thinking. (C3, PLO2) 3. construct, run and debug programs written in C language for assigned project during practical work sessions. (P4, PLO5) 4. demonstrate continuous learning and information management skill in independent acquisition of new knowledge and skill to develop a project. (A3, PLO8)
3	DEE3043 Electronic Circuits	ELECTRONIC CIRCUITS emphasizes the concept of electronic devices applications. The course covers the fundamental of electronic circuit applications which include power supply unit, filters, operational amplifier, timer, oscillator and AD/DA converters. The contents cover circuit configurations, operations and applications of the electronic circuits. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the theoretical concept and principles of electronic circuits to electronic devices by using block diagram or schematic circuit. (C3, PLO1) 2. solve problems related to electronic circuits operation using the theoretical concept of electronic circuits. (C3, PLO2) 3. construct and test various electronic circuits application based on the theory and principle operation of the circuits. (P4, PLO5) 4. demonstrate good communication skill in oral presentation individually on assigned topics within a stipulated time frame. (A3, PLO6)
3	DEE3071 Electronic Computer Aided Design	ELECTRONIC COMPUTER AIDED DESIGN covers the general introduction to the basic concept and fundamentals of electronic simulation and the applications of electronic packages for electronic circuit simulation at the circuit level and the logic level. Attention is also given to the concept of simulation for analogue, digital logic and mixed-signal circuits using various types of simulation analysis using an electronic simulation package such as Protel / Altium Designer, ORCAD, PSpice, Circuit Maker or Electronic Workbench. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. analyze the simulation results for the various types of simulation analysis based on the electronic circuit theory and operations. (C4, PLO3) 2. construct the simulation of analogue and digital circuits with the correct input / output sources and simulation analysis using a schematic capture simulation software. (P4, PLO5) 3. construct the PCB design layout of the various circuits simulated using manual or automatic routing tool in a schematic capture simulation software. (P4, PLO5)

3	DEC3023 Computer Networking Fundamentals	COMPUTER NETWORK FUNDAMENTALS introduces students to the concepts and principles of data transmission and computer networks. This course enables students to correctly use standard terminology in describing the main Local Area Network (LAN) topologies, hardware and software components used in networking. This course provides students with the knowledge and skills to build a network infrastructure using copper cabling, and wireless devices. Students also learn to troubleshoot and secure the network. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply knowledge on network and computer network for a specific implementation. (C3, PLO1) 2. categorize the network protocol, network services, network problem and network security in Local Area Network (LAN). (C4, PLO3) 3. construct a simple LAN or WLAN in accordance to IEE or TIA/EIA-568-A/B wiring standard and network troubleshooting using network simulation tool. (P4, PLO5) 4. demonstrate awareness of the norm practice of professional bodies such as IEEE or TIA/EIA-568-A/B during practical worksession. (A3, PLO10)
3	DEC3033 Computer Architecture and Organization	COMPUTER ARCHITECTURE AND ORGANIZATION course introduces students to the concepts and principles of computer hardware operation and computer's component logic design. This course enables students to correctly design typical logic computer, connection between computer components and use PLD technologies to implement their logic circuit. This course provides students with the knowledge and skills to design basic logic circuit that is use in computer hardware system. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the digital circuit in Arithmetic Logic Unit (ALU) and various functional modules in computer architecture. (C3, PLO1) 2. analyze architecture and organization structure of a computer and the behaviour of various functional modules in a standard computer. (C4, PLO3) 3. construct arithmetic logic and interfacing circuit into the digital circuit using Programmable Logic Devices (PLD) to simulate and implement logic computer design based on schematic entry. (P4, PLO5) 4. display the ability to work in a team during in practical work sessions. (A3,PLO11)
3	DEC3043 Microprocessor Fundamental	MICROPROCESSOR FUNDAMENTAL covers the basic concepts and application of microprocessor-based systems. Students will learn the fundamental concepts and techniques for designing and programming microprocessor-based systems. Microprocessor architecture, assembly language and fundamentals of interfacing will be discussed during the course of study. This course also provides the skills to design memory systems using address decoder. **CREDIT(S) : 3** **PREREQUISITE(S) : DEE2034 DIGITAL ELECTRONICS**	1. apply the concept of a 68000/8086 microprocessor, the organization of the internal register, the memory and the input/output interfacing to microprocessor-based system. (C3, PLO1) 2. design the address decoder to facilitate memory expansion for 68000/8086 microprocessor based system and design a simple project using an interface circuit with input/output (I/O) devices. (C5, PLO4) 3. construct assembly language programmes to interface a microprocessorbased system to external peripherals using PPI 8255/PIA 6821 chip. (P4, PLO5) 4. demonstrate the ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO11)

5	DEE3061 COMPUTER AIDED DESIGN	COMPUTER AIDED DESIGN provides knowledge and exposure on the usage of AutoCAD software. The course focuses on the application of the software to produce drawings of graphics, electrical / electronic component symbols, circuit schematics and electrical wiring layout diagram. The skills acquired from this course will also equip students with the ability to learn and use other similar software. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. apply computer aided design concept, applications and capabilities in electrical engineering environment. (C3, PL01) 2. manipulate the draw and edit commands and the various data input techniques in AutoCAD software to reproduce given simple and complex technical drawings. (P4, PLO5) 3. construct the technical graphics, electronic circuits schematics and electrical wiring layout diagrams using AutoCAD software based on American/British technical symbol standard. (P4, PLO5)
5	DEC5052 Embedded System Application	EMBEDDED SYSTEM APPLICATIONS covers the basic concept and application of microcontroller system based on Peripheral Interface Controller (PIC) microcontroller. Students will learn software and hardware development on PIC16F/PIC18F microcontroller development system and understand how to do interfacing with external devices using suitable internal chip features. Students are exposed to the new Microcontroller Unit (MCU) simulation software such as Proteus. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply suitable software and hardware development on PIC16F/PIC18F microcontroller system to interface with external devices using suitable internal chip features. (C3, PLO1) 2. design embedded system application based on PIC16F/PIC18F microcontroller effectively. (C5, PLO4) 3. construct and simulate real-time embedded system application based on PIC16F/PIC18F microcontroller effectively. (P4, PLO5) 4. demonstrate the ability to lead a team to complete assigned project / practical work within a stipulated time frame. (A3, PLO11)
5	DEC5062 Visual Basic Programming	VISUAL BASIC PROGRAMMING introduces students to event-driven programming using Microsoft Visual Basic. This module covers designing an application in Windows environment, creating forms, compiling an application, interacting with databases, error checking and debugging, and testing of the application. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply knowledge of basic concepts of object oriented programming to develop standalone application programmes. (C3, PL01). 2. design an application programmes according to the standard procedure of Visual Basic Programming. (C5, PL04). 3. construct, run and debug programs written in Visual Basic language for assigned project during practical work sessions. (P4, PLO5) 4. demonstrate continuous learning and information management skill while engaging in independent requisition of new knowledge and skill to develop a project (A3, PLO8)

5	DEC5073 Database System	DATABASE SYSTEM course offers a comprehensive coverage of basic concept and application of data manipulation. Student will learn the fundamental concepts and techniques for designing and developing database and manipulating data using Structured Query Language (SQL). **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the basic concepts of database model using entity-relationship diagram and translating completed data models by applying normalization technique in logical database designs. (C3, PLO1) 2. solve assigned problems using critical thinking by developing a new database application. (C3, PLO2) 3. manipulate correctly Structured Query Language (SQL) for database using a database management system during practical work sessions. (P4, PLO5) 4. demonstrate good oral communication skill in group presentation on the database application developed based on the assigned problem. (A3, PLO6)
5	DEE5081 Project 1	PROJECT 1 provides knowledge regarding the implementation and development methods of a project based on hardware **or** software **or** a combination of tools and software. This course provides exposure to the selection and early planning of a project, techniques to develop project, application of computer aided design as well as methods of preparing and presenting project. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. conduct research in order to make improvements on a chosen project whether the project is on the hardware, the software or hardware-software interface and submit a proposal. (C3, PLO1) 2. plan project for the chosen category in a Gantt Chart form and deliver a presentation with a written final proposal within a given time frame. (C5,PLO4) 3. carry out project construction procedures (hardware project) or produce flowchart and draft algorithm for system programme (software project) systematically. (P4, PLO5) 4. demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop the chosen project. (A3, PLO8)
6	DEC6103 Operating Systems	OPERATING SYSTEM course introduces the fundamentals of operating systems. Topics included are inter-process communication, process scheduling, deadlock, memory management, virtual memory and file system. Formal principles are illustrated with examples and case studies of one or more contemporary operating system. The course shall enable students to develop skills to install and configure a server using Microsoft Windows network operating system and Open Source network operating system. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply configuration of operating system by consider hardware compatibility and software to produce maximum performance of operating system.(C3, PLO1) 2. analyze the step process performed by operating system based on management of memory, resource and file to ensure the computer system operates at optimum performance. (C4, PLO3) 3. install and configure correctly workstation and domain server using MS Windows server or Open Source server operating system. (P4, PLO5) 4. demonstrate good oral communication skill in group presentation on essay topic and on assigned presentation topic within a stipulated time frame. (A3, PLO6)

6	DEE6092 Project 2	PROJECT 2 is the continuation of DEE5081 PROJECT 1 course. The course focuses on methods of circuit construction, testing, troubleshooting, debugging, repair and also completion of the project which was planned during the previous semester. This course also requires students to prepare a project report in a given format and deliver a project presentation at the end of the semester. **CREDIT(S) : 2** **PREREQUISITE(S) :** **DEE5081 PROJECT 1**	1. prepare an oral presentation of the project, in group or individually, inclusive of a final report written in a standard format with the necessary technical data referred to during project implementation. (C3, PLO1) 2. design project prototype (hardware project) with suitable and attractive casing or complete system programme (software project) with user interface. (C5,PLO4) 3. conduct circuit testing, troubleshooting and repair based on electrical circuit fault finding and operation theory (hardware project) or test run, debug and execute system programme (software project). (P4, PLO5) 4. display the awareness of entrepreneurial elements in the project produced. (A3 ,PLO9)
6	DEC6113 Computer System Diagnosis and Maintenance	COMPUTER SYSTEM DIAGNOSIS AND MAINTENANCE course provides knowledge on the general concept of computer system diagnosis and maintenance. Students are exposed to computer system hardware, laptop system, computer peripherals and security. The course focuses on the methods of operation, installation, diagnostic, troubleshooting and maintenance in computer hardware. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the knowledge of fundamental components and security system of personal computer, laptop and computer peripherals in troubleshooting techniques. (C3,PLO1) 2. analyze and investigate the fault in personal computer, laptop, printer and computer peripherals using diagnostic procedures. (C4, PLO3) 3. organize systematically the installation, configuration, optimization, upgrade and preventive maintenance on personal computer, laptop, computer peripherals and security system. (P5, PLO5) 4. demonstrate awareness of social responsibility safety and health in practical work during computer troubleshooting and maintenance using proper troubleshooting procedures. (A3, PLO7)
6	DEE6113 CMOS Integrated Circuit Design	CMOS INTEGRATED CIRCUIT DESIGN course exposes the students to the basic integrated circuit (IC) fabrication processes including MOS transistor and Microelectromechanical System (MEMS) fabrication process. This course also covers the principles of CMOS inverter and CMOS integrated circuit design. Furthermore, the students will be equipped with the knowledge of designing the inverter and simple to complex digital CMOS gates. The students will experience developing the physical layout of integrated circuit using CAD tools complying with specific design rules. Finally, this course will also cover the topic on design methodology that is used in designing integrated circuit. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the knowledge of integrated circuit evolution, classification and design methodology in CMOS IC design. (C3, PLO1) 2. design the logic gates and Boolean functions for static and dynamic CMOS and the stick diagram of the IC layouts. (C5, PLO4) 3. manipulate the layout design of a CMOS circuit using layout design software based on specific CMOS layout design rules. (P4, PLO5) 4. demonstrate good oral communication skill in group presentation on assigned topic(s) within a stipulated time frame. (A3, PLO6)

6	DUT40110 Industrial Training	INDUSTRIAL TRAINING exposes students to related workplace competencies demanded by industries. This course provides exposure to students in terms of technology literacy, effective communication, practice social skills and teamwork, policies, procedures and regulations, professional ethics and reporting. It also equips students with real work experience, thus helping students to perform as novice workers. **CREDIT(S) : 10** **PREREQUISITE(S) : NONE**	1. apply related knowledge and skills at the workplace. (C3, P2) 2. communicate effectively with others. (A3) 3. practice teamwork. (A5) 4. professionally and ethically comply with policies, procedures and rules of the organization. (A5) 5. explain the tasks assigned (during the industrial training) according to the prescribed format. (P2, A4)

ELECTIVE			
5/6	DEEO5252 Optoelectronic	OPTOELECTRONIC emphasizes the components of optoelectronic devices. Students will learn the fundamental theory of Semiconductor physics. This course includes the light source and optical detector. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the knowledge of solid state physics in semiconductor optoelectronic devices. (C3, PLO1) 2. Analyze the operation of optoelectronic components based on semiconductor physics theory. (C4, PLO3) 3. Demonstrate awareness of social safety and health through essay question. (A3,PLO7)
5/6	DEEO6262 Optosemiconductor	OPTOSEMICONDUCTOR covers the theory of semiconductors. Students will learn the electrical and optical properties of Light Emitting Diode. This course emphasizes the design of LED based on radiative recombination theory. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the theory of recombination process in LED. (C3, PLO1) 2. Design LED based on electrical and optical properties. (C5, PLO4) 3. Demonstrate continuous learning and information management skill in independent acquisition of new knowledge and skill through case study. (A3,PLO8)
5/6	DEE6132 CMOS VLSI Layout Design	CMOS VLSI LAYOUT DESIGN course introduces the student to the design of CMOS VLSI layout. The contents include the knowledge of integrated circuit fabrication process, layout quality, hierarchy concept, auto place and route, electronic discharge, full chip integration and tape out. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply fundamentals of CMOS VLSI Layout Design from transistor up to system level based on bottom up design methodology. (C3, PLO1) 2. design CMOS VLSI Layout based on design rules to solve a given problem correctly. (C4, PLO4) 3. construct CMOS VLSI Layout Design using layout analysis tool software. (P4, PLO5)

ELECTIVE			
5/6	DEC6122 Embedded Robotic	EMBEDDED ROBOTIC presents the combination of mobile robots and embedded systems, from introductory to intermediate level. It is structured in three parts, which are embedded systems, mobile robot, and mobile robot applications. These parts are essential to students in mastering the crucial steps of building a complete working robotic system. They will help them to develop robots that not only can move, but intelligent as well. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply the concept and fundamentals of mobile robotic, embedded controller, sensors and actuators based on land mobile robot design. (C3, PLO1) 2. analyze the concept of robot positioning, identification and communication in mobile robot control according to a standard robot organization regulation. (C4, PLO3) 3. manipulate the application of sensor and actuator, robot identification and communication during practical work based on land mobile robot design. (P4, PLO5) 4. demonstrate good communication skill in oral presentation and answer question with confidence for assigned topics within a stipulated time frame. (A3, PLO6)
5/6	DEC5082 Interactive Multimedia Application	INTERACTIVE MULTIMEDIA APPLICATIONS exposes students to the process of creating interactive multimedia presentations including the role of and design of multimedia systems which incorporate digital audio, graphics and video, underlying concepts and representations of sound, pictures and video, data compression and transmission, integration of media, multimedia authoring, and delivery of multimedia. Students will produce a final digital interactive multimedia projects. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply basic concepts of multimedia to develop a multimedia interactive application. (C3, PLO1) 2. design a multimedia interactive presentation incorporating motion graphics or animation, with typography, sound, and special effects for finished interactive multimedia project. (C5, PLO4) 3. produce multimedia elements like typography, graphic, sound, video and animation for various delivery methods in a ready to use files. (P4, PLO5)
5/6	DEJ5153 Programmable Logic Controller (PLC) And Automation	PROGRAMMABLE LOGIC CONTROLLER (PLC) AND AUTOMATION provides knowledge regarding the concept and principle of automation system. This course emphasizes the relationship between hardwired relay ladder logic and PLC system, application of various industrial input and output devices of PLC, design process, programming and PLC maintenance method. This course also provides knowledge and skills in designing of controlling automation system based on PLC. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. explain clearly blocks, parts, components and instructions found in the automation systems. (C2, PLO1) 2. design simple automation sequential control using electromechanical devices and PLC. (C5, PLO4) 3. display the ability to do troubleshooting and maintenance of hardwired and PLC systems using appropriate equipment. (P4, PLO5) 4. demonstrate understanding of PLC automation system norm and standard which are IEC and NEMA standards during practical work session. (A3, PLO10)

6.3.7 PROGRAMME STRUCTURE (DTK)

COURSE CODE	COURSE	L	P	T	C
SEMESTER 1					
DUB1012	Pengajian Malaysia	1	0	2	2
DUE1012	Communicative English 1	1	0	2	2
DRB1000	Asas Unit Beruniform	0	2	0	0
DUW1012	Occupational, Safety and Health	2	0	0	2
DBM1013	Engineering Mathematics 1	2	0	2	3
DBS1012	Engineering Science	2	1	0	2
DET1013	Electrical Technology	2	2	0	3
DET1022	Electrical Wiring	0	3	0	2
DEE1012	Measurement	1	2	0	2
	TOTAL	**25**			**18**
SEMESTER 2					
DUA2012	Sains Teknologi dan Kejuruteraan Islam*	1	0	2	2
DUB2012	Nilai Masyarakat Malaysia**	1	0	2	2
DRS2001	Sukan	0	2	0	1
DRB2001	Unit Beruniform 1	0	2	0	1
DBM2013	Engineering Mathematics 2	2	0	2	3
DET2033	Electrical Circuits	2	2	0	3
DEE2023	Semiconductor Devices	2	2	0	3
DEE2034	Digital Electronics	3	2	0	4
DEC2012	Fundamental Programming	1	2	0	2
	TOTAL	**25**			**18**
SEMESTER 3					
DUE3012	Communicative English 2	1	0	2	2
DRK3002	Kelab/Persatuan	0	4	0	2
DRB3002	Unit Beruniform 2	0	4	0	2
DEE3043	Electronic Circuits	2	2	0	3
DEE3071	Electronic Computer Aided Design	0	2	0	1
DEC3023	Computer Networking Fundamentals	2	2	0	3
DEC3033	Computer Architecture and Organization	2	2	0	3
DEC3043	Microprocessor Fundamental	2	2	0	3
	TOTAL	**25**			**17**
SEMESTER 4					
DUE5012	Communicative English 3	1	0	2	2
DBM3023	Electrical Engineering Mathematics	2	0	2	3
DEE3061	Computer Aided Design	0	2	0	1
DEC5052	Embedded System Application	1	2	0	2
DEC5062	Visual Basic Programming	1	2	0	2
DEC5073	Database System	2	2	0	3
DEE5081	Project 1	0	2	0	1
	***Elective 1	1	2	0	2
	TOTAL	**24**			**16**

COURSE CODE	COURSE	L	P	T	C
SEMESTER 5					
DUA6022	Komunikasi dan Penyiaran Islam	1	0	2	2
DPB2012	Entrepreneurship	2	1	0	2
DEC6103	Operating Systems	2	2	0	3
DEE6092	Project 2	0	3	0	2
DEC6113	Computer System Diagnosis and Maintenance	2	2	0	3
DEE6113	CMOS Integrated Circuit Design	2	2	0	3
	***Elective 2	1	2	0	2
	TOTAL	**24**			**17**
SEMESTER 6					
DUT40110	Industrial Training	10			
	GRAND TOTAL				**96**

*** Students can select any of the elective courses that are offered by the department. Students are required to take a minimum of four credits of elective course.

COURSE CODE	COURSE	L	P	T	C
*****Elective**					
DEC5082	Interactive Mutimedia Applications	1	2	0	2
DEO5252	Optoelectronic	2	0	1	2
DEO6262	Optosemiconductor	2	0	1	2
DEC6122	Embedded Robotic	1	2	0	2
DEE6132	CMOS VLSI Layout Design	1	2	0	2
DEJ5153	Programmable Logic Controller	2	2	0	3

L : LectureT : TutorialP : Practical/LabC : Credit

ELECTRICAL ENGINEERING
DEPARTMENT

OPTOELECTRONIC

6.4 DIPLOMA IN ELECTRONIC ENGINEERING (OPTOELECTRONIC)

6.4.1 PROGRAMME OVERVIEW

INTRODUCTION

The Diploma in Electronic Engineering (Optoelectronic) is designed to cover the current wide discipline of electronic engineering with the added specialization of microelectronic with optical technology known as optoelectronic. Graduate are forecast to serve in the field of optoelectronic, microelectronic, fiber optic and semiconductor industries. The use of optoelectronic in semiconductor industries today requires skilled and trained engineers necessary for these new challenges. The program structure and syllabus of the Polytechnic's Ministry of Education Malaysia equips its graduates with the latest technical skills necessary in the area of specialization.

An electronic engineering (optoelectronic) diploma graduate of the Polytechnic's Ministry of Education Malaysia will cover core courses such as mathematics, fundamental of electricity, electronics and solid state devices. Graduates of this programme will be equipped with specialized knowledge and skills namely optical fundamental, optoelectronic, advanced optoelectronic and fiber optic communication system.

The 6 semester approach of The Diploma in Electronic Engineering (Optoelectronic) is designed to provide an electronic engineering diploma graduate with the possibility of articulating towards a career in the field of optoelectronics in microelectronic and semiconductor industries. This multidisciplinary field involves the application of the microelectronics and semiconductor industries in solving problems in optoelectronic field. With the advent of optoelectronics, more and more participation of engineers is being demanded in the field of microelectronic and semiconductor industries. This has necessitated the birth of electronic technician, who are able to grasp the essences of microelectronic and semiconductor industries with a solid background in the field of electronic engineering.

SYNOPSIS

The Diploma in Electronic Engineering (Optoelectronic) is designed to cover the current wide discipline of electronic engineering, with the added specialization of electronics used in the field

6.4.2 JOB PROSPECT

This programme provides the knowledge and skills in optoelectronic engineering that can be applied to a broad range of careers in most microelectronic and semiconductor industries. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:-

- Optoelectronic Assistant Engineer / Technician
- Electronic Lab Technician
- Fiber Optic Splicing Technician
- Product Technologies Assistant Engineer
- Process Assistant Engineer
- IC Product Engineer Assistant
- Marketing Executive
- Self-employed

6.4.3 PROGRAMME AIM

The Diploma in Electronic Engineering (Optoelectronic) graduates in Polytechnics, Minister of Education Malaysia will have knowledge, technical skills and attitude to adapt themselves with new technological advancement and challenges in optoelectronic and electronic fields.

6.4.4 PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Electronic Engineering (Optoelectronic) programme shall produce semiprofessionals that are:

1. knowledgeable and technically competent in optoelectronic in electronics discipline and able to adapt themselves with new technological advancement and challenges in electronic and optoelectronic fields.
2. effective in communication and contribute effectively as a team member with the capability of being a leader.
3. capable to solve optoelectronic and electronic problems innovatively, creatively and ethically with social responsibility toward developing country and community.
4. able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement.

6.4.5 PROGRAMME LEARNING OUTCOMES

Upon completion of the programme, graduates should be able to:

1. apply technical knowledge and social science / humanities knowledge to well defined electrical and electronic engineering problems and to the personality development of individual respectively.
2. solve well-defined electrical and electronic engineering related problems systematically by applying critical thinking skill and using appropriate tools and techniques.
3. analyze and investigate well-defined electrical and electronic engineering problems.
4. design well defined engineering solutions for electrical and electronic engineering systems.
5. demonstrate practical skill in utilizing modern electrical and electronic engineering tools and design packages.
6. communicate effectively with the engineering community and the society at large.
7. demonstrate awareness and consideration for societal, health, safety, legal and cultural issues and the consequent responsibilities, taking into account the need for sustainable development.
8. engage in independent acquisition of new knowledge and skill, and recognize the need for professional development and information management.
9. demonstrate an awareness for entrepreneurship.
10. demonstrate understanding of professional ethics, responsibilities and norms of electrical and electronic engineering practices.
11. function individually or in teams, effectively, with the capability to be a leader.

6.4.6 SYNOPSIS AND COURSE LEARNING OUTCOME (DEO)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
1	DET1013 Electrical Technology	ELECTRICAL TECHNOLOGY introduces students to the principles of DC electrical circuits. It covers the fundamental laws, theorems and circuit techniques. This course also covers magnetic and electromagnetic circuits. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the concept and principles of DC electrical circuit using different method and approach. (C3, PLO1) 2. solve DC circuit problems using appropriate DC electrical laws and theorems. (C3, PLO2) 3. conduct the laboratory activities of DC electrical circuit using appropriate electrical equipment. (P4, PLO5) 4. demonstrate ability to work in team to complete assigned task during practical work sessions. (A3, PLO11)
1	DET1022 Electrical Wiring	ELECTRICAL WIRING course exposes students to the aspects of wiring installation. Students will be able to relate theoretical aspect in practical work on electrical wiring during workshop sessions. This course provides the students with the knowledge and skill in doing different types of wiring installation, inspection and testing. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply the concept and principles of electrical safety and wiring in electrical wiring according to NIOSH and MS IEC 60364. (C3, PLO1) 2. solve problems related to single-phase domestic wiring failure according to MS IEC 60364. (C3, PLO2) 3. construct single-phase domestic wiring, wiring inspection & testing, and wiring protection according to MS IEC 60364. (P4, PLO5) 4. demonstrate understanding of engineering norms and practices in electrical wiring during practical work sessions. (A3,PLO10)
1	DEE1012 Measurement	MEASUREMENT introduces students to the basic concept of electrical instrument and measurement. It covers the basic principles of measurement, safety precautions and meter calibration. Students will also use measurement devices such as analogue meters, DC and AC meters, analogue and digital multimeters, oscilloscopes, signal generators and power meters during practical session. This course also covers the basic concept and simple application of DC Bridge. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply the concept of measurement principles and measuring equipment in electrical and electronic measurement. (C3, PLO1) 2. solve problems of electrical and electronic circuit using appropriate measuring operations and theorems. (C3, PLO2) 3. perform meter calibrating and measuring technique using the correct measuring equipment. (P4, PLO5) 4. demonstrate good written communication skill through essay writing in a group on assigned topics within a stipulated time frame. (A3, PLO6)

2	DET2033 Electrical Circuits	ELECTRICAL CIRCUITS designed to provide students with the knowledge of electrical circuits. It emphasizes the principles of an alternating current AC waveform and sinusoidal steady-state circuit analysis. This course also covers the applications of three phase system and operation of various types of transformers. **CREDIT(S) : 3** **PREREQUISITE(S : DET1013 ELECTRICAL TECHNOLOGY**	1. apply the concept and principles of AC electrical circuit and their analysis using AC circuit law. (C3 , PLO1) 2. solve problems of AC electrical circuit using the appropriate AC electrical laws and theorems. (C3 , PLO2) 3. conduct the laboratory exercises of AC electrical circuit using appropriate electrical equipments. (P4 , PLO5) 4. demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3 , PLO11)
2	DEE2023 Semiconductor Devices	SEMICONDUCTOR DEVICES is an introduction to the basic electronic theories and devices. The course covers the fundamentals of electronic devices which includes diodes, bipolar junction transistors and field effect transistors. The content encompasses devices structure to biasing basic applications. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the concept and principles of theoretical characteristics and electrical properties of semiconductor devices. (C3, PLO1) 2. solve problems of semiconductor devices application circuits related to the operation and the characteristics of the circuits. (C3, PLO2) 3. construct and test the various applications of semiconductor devices circuit based on schematic diagrams. (P4, PLO5) 4. demonstrate good communication skill in oral presentation individually or in group, on assigned topics within a stipulated time frame. (A3, PLO6)
2	DEE2034 Digital Electronic	DIGITAL ELECTRONICS introduces the theories on the basic of digital systems. This course emphasizes on the digital system fundamentals and applications. This course mainly covers number systems, code systems, logic gates, Boolean operations, combinational circuits, flip-flops, counters and registers. **CREDIT(S) : 4** **PREREQUISITE(S) : NONE**	1. apply the knowledge of various number systems codes , logic operations and logic gates in digital systems. (C3, PL01) 2. design combinational or sequential logic circuits using Boolean Algebra or Karnaugh Map. (C5, PLO4) 3. manipulate the design of logic diagrams, truth tables and timing diagrams for logic gates and flip-flops and implement them in combinational and sequential logic circuits . (P4, PLO5)
2	DEC2012 Fundamental Programming	FUNDAMENTAL PROGRAMMING course provides the skills necessary for the effective of application of computation and computer programming in engineering applications. Students will develop their programming skills through a variety of assignments and labs and by reviewing case studies and example programs. The learning outcome is proficiency in writing small to medium programs in a procedural programming language. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply knowledge of basic concepts and fundamentals of structured programming. (C3, PLO1) 2. solve a variety of engineering and scientific problems using a high level programming language and apply critical thinking. (C3, PLO2) 3. construct, run and debug programs written in C language for assigned project during practical work sessions. (P4, PLO5) 4. demonstrate continuous learning and information management skill in independent acquisition of new knowledge and skill to develop a project. (A3, PLO8)

3	DEE3034 Electronic Circuits	ELECTRONIC CIRCUITS emphasizes the concept of electronic devices applications. The course covers the fundamental of electronic circuit applications which include power supply unit, filters, operational amplifier, timer, oscillator and AD/DA converters. The contents cover circuit configurations, operations and applications of the electronic circuits. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the theoretical concept and principles of electronic circuits to electronic devices by using block diagram or schematic circuit. (C3, PLO1) 2. solve problems related to electronic circuits operation using the theoretical concept of electronic circuits. (C3, PLO2) 3. construct and test various electronic circuits application based on the theory and principle operation of the circuits. (P4, PLO5) 4. demonstrate good communication skill in oral presentation individually on assigned topics within a stipulated time frame. (A3, PLO6)
3	DEP3273 Communication System Fundamentals	COMMUNICATION SYSTEM FUNDAMENTALS introduces the students to the basic concepts of communication system. This course covers the principles of communications, analog and digital modulation techniques, multiplexing and transmission medium. It also covers basic data communication. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the basic concept of communication system elements, various types of modulation techniques, transmission system and basic data communication in electronic communication by using appropriate diagram. (C3, PLO1) 2. solve a well-defined problems related to noise parameters, modulation parameters, character encoding and information capacity using designated method and formula. (C3, PLO2) 3. construct and test various applications of related communication equipments in performing the assigned practical work using standard test equipment. (P4, PLO5) 4. demonstrate ability to work in a team to complete assigned tasks during practical work sessions. (A3, PLO11)
3	DEE3061 Electronic Computer Aided Design (ECAD)	COMPUTER AIDED DESIGN provides knowledge and exposure on the usage of AutoCAD software. The course focuses on the application of the software to produce drawings of graphics, electrical / electronic component symbols, circuit schematics and electrical wiring layout diagram. The skills acquired from this course will also equip students with the ability to learn and use other similar software. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. apply computer aided design concept, applications and capabilities in electrical engineering environment. (C3, PL01) 2. manipulate the draw and edit commands and the various data input techniques in AutoCAD software to reproduce given simple and complex technical drawings. (P4, PLO5) 3. construct the technical graphics, electronic circuits schematics and electrical wiring layout diagrams using AutoCAD software based on American/British technical symbol standard. (P4, PLO5)

3	DEE3052 Eelctronic Equipment Repair	ELECTRONIC EQUIPMENT REPAIR provides knowledge and skills on troubleshoot and repair of the electronics equipment. This course focuses on the identification of faults in audio amplifier, regulated dc power supply, radio CD player and colour TV receiver. This course also provides knowledge and skill on trouble shoot and repair of the electronic laboratory equipment. **CREDIT(S) : 2** **PREREQUISITE(S) : DEE2023 SEMICONDUCTOR DEVICES**	1. apply the knowledge of hand tools, soldering technique and test equipment in troubleshooting and repairing electronic equipment. (C3, PLO1) 2. solve problems related to electronic equipment repair using the correct diagnosis technique. (C3, PLO2) 3. fix the electronic equipment fault using the correct diagnosis technique. (P4, PLO5) 4. demonstrate an awareness of entrepreneurship in repairing the domestic electronic appliances through essay question within a stipulated time frame. (A3, PLO9).
3	DEO3243 Optical Fundamental	OPTICAL FUNDAMENTAL covers the basic concepts of photonics. Students will learn the fundamental theory of light produced by electromagnetism and photonics. This course emphasizes the geometrical optic through the laws of reflection and refraction, system of lens, paraxial optic and optical aberrations. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. Apply the knowledge of physic in light and optic. (C3, PLO1) 2. Solve optical problems based on geometrical optic. (C3, PLO2) 3. Measure the optical behavior by using appropriate optical tools. (P3, PLO5) 4. Demonstrate good communication skill in oral presentation in group, on assigned topics within a stipulated time frame. (A3, PLO6)
4	DEC3023 Computer Networking Fundamentals	COMPUTER NETWORK FUNDAMENTALS introduces students to the concepts and principles of data transmission and computer networks. This course enables students to correctly use standard terminology in describing the main Local Area Network (LAN) topologies, hardware and software components used in networking. This course provides students with the knowledge and skills to build a network infrastructure using copper cabling, and wireless devices. Students also learn to troubleshoot and secure the network. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply knowledge on network and computer network for a specific implementation. (C3, PLO1) 2. categorize the network protocol, network services, network problem and network security in Local Area Network (LAN). (C4, PLO3) 3. construct a simple LAN or WLAN in accordance to IEE or TIA/EIA-568-A/B wiring standard and network troubleshooting using network simulation tool. (P4, PLO5) 4. demonstrate awareness of the norm practice of professional bodies such as IEEE or TIA/EIA-568-A/B during practical work session. (A3, PLO10)

4	DEE5081 Project 1	PROJECT 1 provides knowledge regarding the implementation and development methods of a project based on hardware **or** software **or** a combination of tools and software. This course provides exposure to the selection and early planning of a project, techniques to develop project, application of computer aided design as well as methods of preparing and presenting project. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. conduct research in order to make improvements on a chosen project whether the project is on the hardware, the software or hardware-software interface and submit a proposal. (C3, PLO1) 2. plan project for the chosen category in a Gantt Chart form and deliver a presentation with a written final proposal within a given time frame. (C5, PLO4) 3. carry out project construction procedures (hardware project) or produce flowchart and draft algorithm for system programme (software project) systematically. (P4, PLO5) 4. demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop the chosen project. (A3, PLO8).
4	DEC5051 Embedded System Application	EMBEDDED SYSTEM APPLICATIONS covers the basic concept and application of microcontroller system based on Peripheral Interface Controller (PIC) microcontroller. Students will learn software and hardware development on PIC16F/PIC18F microcontroller development system and understand how to do interfacing with external devices using suitable internal chip features. Students are exposed to the new Microcontroller Unit (MCU) simulation software such as Proteus. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply suitable software and hardware development on PIC16F/PIC18F microcontroller system to interface with external devices using suitable internal chip features. (C3, PLO1) 2. design embedded system application based on PIC16F/PIC18F microcontroller effectively. (C5, PLO4) 3. construct and simulate real-time embedded system application based on PIC16F/PIC18F microcontroller effectively. (P4, PLO5) 4. demonstrate the ability to lead a team to complete assigned project / practical work within a stipulated time frame. (A3, PLO11).
4	DEO5252 Optoelectronic	OPTOELECTRONIC emphasizes the components of optoelectronic devices. Students will learn the fundamental theory of semiconductor physics. This course includes the light source and optical detector. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the knowledge of solid state physics in semiconductor optoelectronic devices. (C3, PLO1) 2. Analyze the operation of optoelectronic components based on semiconductor physics theory. (C4, PLO3) 3. Demonstrate awareness of social safety and health through essay question. (A3, PLO7)
4	DEP5313 Fibre Optic Communication System	FIBER OPTIC COMMUNICATION SYSTEM introduces students to the basic concept of fiber optic communication systems. This course covers fiber optic characteristics, losses in fiber optic cable and the fundamental concept of optical measurement. This course also provides knowledge in splicing techniques, multiplexing techniques and design consideration in fiber optic communication system. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. Apply the concepts of light properties in the fiber optic communication system. (C3, PLO1) 2. Solve problems regarding light transmission in fiber optic communication link. (C3, PLO2) 3. Design fiber optic communication link using link budget. (C5, PLO4) 4. Display the ability to handle systematically the testing instruments for fiber optic communication system. (P4,PLO5)

5	DEE6113 CMOS Integrated Circuit Design	CMOS INTEGRATED CIRCUIT DESIGN course exposes the students to the basic integrated circuit (IC) fabrication processes including MOS transistor and Microelectromechanical System (MEMS) fabrication process. This course also covers the principles of CMOS inverter and CMOS integrated circuit design. Furthermore, the students will be equipped with the knowledge of designing the inverter and simple to complex digital CMOS gates. The students will experience developing the physical layout of integrated circuit using CAD tools complying with specific design rules. Finally, this course will also cover the topic on design methodology that is used in designing integrated circuit. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the knowledge of integrated circuit evolution, classification and design methodology in CMOS IC design. (C3, PLO1) 2. design the logic gates and Boolean functions for static and dynamic CMOS and the stick diagram of the IC layouts. (C5, PLO4) 3. manipulate the layout design of a CMOS circuit using layout design software based on specific CMOS layout design rules. (P4, PLO5) 4. demonstrate good oral communication skill in group presentation on assigned topic(s) within a stipulated time frame. (A3, PLO6)
5	DEE6092 Project 2	PROJECT 2 is the continuation of EE501 PROJECT 1 course. The course focuses on methods of circuit construction, testing, troubleshooting, debugging, repair and also completion of the project which was planned during the previous semester. This course also requires students to prepare a project report in a given format and deliver a project presentation at the end of the semester. **CREDIT(S) : 2** **PREREQUISITE(S) : DEE5081 PROJECT 1**	1. prepare an oral presentation of the project, in group or individually, inclusive of a final report written in a standard format with the necessary technical data referred to during project implementation. (C3, PLO1) 2. design project prototype (hardware project) with suitable and attractive casing or complete system programme (software project) with user interface. (C5, PLO4) 3. conduct circuit testing, troubleshooting and repair based on electrical circuit fault finding and operation theory (hardware project) or test run, debug and execute system programme (software project). (P4, PLO5) 4. display the awareness of entrepreneurial elements in the project produced. (A3 ,PLO9)
5	DEE6132 VLSI layout Design	CMOS VLSI LAYOUT DESIGN course introduces the student to the design of CMOS VLSI layout. The contents include the knowledge of integrated circuit fabrication process, layout quality, hierarchy concept, auto place and route, electronic discharge, full chip integration and tape out. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply fundamentals of CMOS VLSI Layout Design from transistor up to system level based on bottom up design methodology. (C3, PLO1) 2. design CMOS VLSI Layout based on design rules to solve a given problem correctly. (C4, PLO4) 3. construct CMOS VLSI Layout Design using layout analysis tool software. (P4, PLO5)

5	DEO6263 Optosemiconductor	OPTOSEMICONDUCTOR covers the theory of semiconductors. Students will learn the electrical and optical properties of Light Emitting Diode. This course emphasizes the design of LED based on radiative recombination theory. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the theory of recombination process in LED. (C3, PLO1) 2. Design LED based on electrical and optical properties. (C5, PLO4) 3. Demonstrate continuous learning and information management skill in independent acquisition of new knowledge and skill through case study. (A3, PLO8)

ELECTIVE			
4/5	DEJ5153 Programmable Logic Controller (CLO) & Automation	PROGRAMMABLE LOGIC CONTROLLER (PLC) AND AUTOMATION provides knowledge regarding the concept and principle of automation system. This course emphasizes the relationship between hardwired relay ladder logic and PLC system, application of various industrial input and output devices of PLC, design process, programming and PLC maintenance method. This course also provides knowledge and skills in designing of controlling automation system based on PLC. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. explain clearly blocks, parts, components and instructions found in the automation systems. (C2, PLO1) 2. design simple automation sequential control using electromechanical devices and PLC. (C5, PLO4) 3. display the ability to do troubleshooting and maintenance of hardwired and PLC systems using appropriate equipment. (P4, PLO5) 4. demonstrate understanding of PLC automation system norm and standard which are IEC and NEMA standards during practical work session. (A3, PLO10)
4/5	DEC6113 Computer System Diagnosis And Maintenance	COMPUTER SYSTEM DIAGNOSIS AND MAINTENANCE course provides knowledge on the general concept of computer system diagnosis and maintenance. Students are exposed to computer system hardware, laptop system, computer peripherals and security. The course focuses on the methods of operation, installation, diagnostic, troubleshooting and maintenance in computer hardware. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the knowledge of fundamental components and security system of personal computer, laptop and computer peripherals in troubleshooting techniques. (C3, PLO1) 2. analyze and investigate the fault in personal computer, laptop, printer and computer peripherals using diagnostic procedures. (C4, PLO3) 3. organize systematically the installation, configuration, optimization, upgrade and preventive maintenance on personal computer, laptop, computer peripherals and security system. (P5, PLO5) 4. demonstrate awareness of social responsibility safety and health in practical work during computer troubleshooting and maintenance using proper troubleshooting procedures.
4/5	DEC5082 Interactive Multimedia Applications	INTERACTIVE MULTIMEDIA APPLICATIONS exposes students to the process of creating interactive multimedia presentations including the role of and design of multimedia systems which incorporate digital audio, graphics and video, underlying concepts and representations of sound, pictures and video, data compression and transmission, integration of media, multimedia authoring, and delivery of multimedia. Students will produce a final digital interactive multimedia projects. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply basic concepts of multimedia to develop a multimedia interactive application. (C3, PLO1) 2. design a multimedia interactive presentation incorporating motion graphics or animation, with typography, sound, and special effects for finished interactive multimedia project. (C5, PLO4) 3. produce multimedia elements like typography, graphic, sound, video and animation for various delivery methods in a ready to use files. (P4, PLO5)

ELECTIVE			
4/5	DEC6122 Embedded Robotic	EMBEDDED ROBOTIC presents the combination of mobile robots and embedded systems, from introductory to intermediate level. It is structured in three parts, which are embedded systems, mobile robot, and mobile robot applications. These parts are essential to students in mastering the crucial steps of building a complete working robotic system. They will help them to develop robots that not only can move, but intelligent as well. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply the concept and fundamentals of mobile robotic, embedded controller, sensors and actuators based on land mobile robot design. (C3, PLO1) 2. analyze the concept of robot positioning, identification and communication in mobile robot control according to a standard robot organization regulation. (C4, PLO3) 3. manipulate the application of sensor and actuator, robot identification and communication during practical work based on land mobile robot design. (P4, PLO5)

6.3.7 PROGRAMME STRUCTURE (DEO)

COURSE CODE	COURSE	L	P	T	C
SEMESTER 1					
DUB1012	Pengajian Malaysia	1	0	2	2
DUE1012	Communicative English 1	1	0	2	2
DRB1000	Asas Unit Beruniform	0	2	0	0
DUW1012	Occupational, Safety and Health	2	0	0	2
DBM1013	Engineering Mathematics 1	2	0	2	3
DBS1012	Engineering Science	2	1	0	2
DET1013	Electrical Technology	2	2	0	3
DET1022	Electrical Wiring	0	3	0	2
DEE1012	Measurement	1	2	0	2
	TOTAL	**25**			**18**
SEMESTER 2					
DUA2012	Sains Teknologi dan Kejuruteraan Islam*	1	0	2	2
DUB2012	Nilai Masyarakat Malaysia**	1	0	2	2
DRS2001	Sukan	0	2	0	1
DRB2001	Unit Beruniform 1	0	2	0	1
DBM2013	Engineering Mathematics 2	2	0	2	3
DET2033	Electrical Circuits	2	2	0	3
DEE2023	Semiconductor Devices	2	2	0	3
DEE2034	Digital Electronics	3	2	0	4
DEC2012	Fundamental Programming	1	2	0	2
	TOTAL	**25**			**18**
SEMESTER 3					
DUE3012	Communicative English 2	1	0	2	2
DRK3002	Kelab/Persatuan	0	4	0	2
DRB3002	Unit Beruniform 2	0	4	0	2
DEE3043	Electronic Circuits	2	2	0	3
DEE3052	Electronic Equipment Repair	1	3	0	2
DEE3061	Computer Aided Design	0	2	0	1
DEE3071	Electronic Computer Aided Design	0	2	0	1
DEP3273	Communication System Fundamentals	2	2	0	3
DEO3243	Optical Fundamental	2	2	0	3
	TOTAL	**27**			**17**
SEMESTER 4					
DUE5012	Communicative English 3	1	0	2	2
DBM3023	Electrical Engineering Mathematics	2	0	2	3
DEC3023	Computer Networking Fundamentals	2	2	0	3
DEC5052	Embedded System Application	1	2	0	2
DEO5252	Optoelectronic	2	0	1	2
DEP5313	Fibre Optic Communication System	2	2	0	3
DEE5081	Project 1	0	2	0	1
	***Elective 1	1	2	0	2

COURSE CODE	COURSE	L	P	T	C
	TOTAL	**26**			**18**
SEMESTER 5					
DUA6022	Komunikasi dan Penyiaran Islam	1	0	2	2
DPB2012	Entrepreneurship	2	1	0	2
DEE6092	Project 2	0	3	0	2
DEE6113	CMOS Integrated Circuit Design	2	2	0	3
DEE6132	CMOS VLSI Layout Design	1	2	0	2
DEO6262	Optosemiconductor	2	0	1	2
	***Elective 2	1	2	0	2
	TOTAL	**22**			**15**
	GRAND TOTAL				**96**
SEMESTER 6					
DUT40110	Industrial Training	**10**			

*** Students can select any of the elective courses that are offered by the department. Students are required to take a minimum of four credits of elective course.

COURSE CODE	COURSE	L	P	T	C
*****Elective**					
DEC5082	Interactive Mutimedia Applications	1	2	0	2
DEC6113	Computer System Diagnosis and Maintenance	2	2	0	3
DEC6122	Embedded Robotic	1	2	0	2
DEJ5153	Programmable Logic Controller	2	2	0	3

L : LectureT : TutorialP : Practical/LabC : Credit

ELECTRICAL ENGINEERING
DEPARTMENT

COMMUNICATION

6.5 DIPLOMA IN ELECTRONIC ENGINEERING (COMMUNICATION)

6.5.1 PROGRAMME OVERVIEW

INTRODUCTION

Electronic engineering is another branch of engineering that deals with practical application of designing, fabrication and operations of electronic circuits, electronic devices, broadcast and communication system imaging which operates at low voltage sources as part of its driving force.

The Diploma in Electronic Engineering (Communication) is a three-year full-time programme comprising of six semesters course work with one full semester of industrial training built-in. Students are prepared for their future role in the economy by building a solid foundation in technical knowledge and the necessary skills, related to the field of electronic communication engineering.

SYNOPSIS

The Diploma in Electronic Engineering (Communication) covers broad discipline of electronics engineering, with specialization in communication technology. The programme is designed with a broad-based electrical and electronic engineering foundation which includes mathematics, electrical and electronic fundamentals, computer fundamentals and programming, communication system fundamentals, semiconductor devices, wiring installation and computer aided design which provides versatility to the graduates, while emphasizing the area of specialization towards the end of the programme. The specialization courses include telephony, fibre optic communication, data communication and networking, wireless communication and microwave devices.

Apart from the technical knowledge and skills, the programme also emphasizes on the development of the individual potential of students in an integrated and holistic manner through courses such as Sains, Teknologi dan Kejuruteraan Islam, Nilai Masyarakat Malaysia, Co-curriculum, and Entrepreneurship.

6.5.2 JOB PROSPECT

This programme provides the knowledge and skills in communication engineering that can be applied to a broad range of careers in most electronic communication field. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:-

- Assistant Engineers / Technical Executive
- Sales Executive
- Supervisor
- Assistant Radio Frequency (RF) Engineer
- Assistant Electronic Engineer
- Assistant Technical Designer
- Self Employed in related field
- Enterpreneur
- Assistant Networking Engineer
- Assistant Network Administrator

6.5.3 PROGRAMME AIM

The Diploma in Electronic Engineering (Communication) graduates in Polytechnics, Ministry of Education Malaysia will have the knowledge, technical skills, communication skills and attitude to adapt themselves with new technological advancement and challenges in the electronics communication field.

6.5.4 PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Electronics Engineering (Communication) programme shall produce semiprofessionals that are:

1. knowledgeable and technically competent in electronics communication disciplines with capability to solve electronic communication problems.
2. effective in communication and contribute effectively as a team member with the capability of being a leader.
3. ethically and socially responsible towards developing the country and the community.
4. able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement and able to adapt themselves with new technological challenges in electronic communication fields.

6.5.5 PROGRAMME LEARNING OUTCOMES

Upon completion of the programme, graduates should be able to:

1. apply technical knowledge and social science / humanities knowledge to well defined electrical and electronic engineering problems and to the personality development of an individual, respectively;
2. solve well-defined electrical and electronic engineering related problems systematically by applying critical thinking skill and using appropriate tools and techniques;
3. analyze and investigate well-defined electrical and electronic engineering problems;
4. design well defined engineering solutions for electrical and electronic engineering systems;
5. demonstrate practical skill in utilizing modern electrical and electronic engineering tools and design packages;

6. communicate effectively with the engineering community and the society at large;
7. demonstrate awareness and consideration for societal, health, safety, legal and cultural issues and the consequent responsibilities, taking into account the need for sustainable development;
8. engage in independent acquisition of new knowledge and skill, and recognize the need for professional development and information management;
9. demonstrate an awareness for entrepreneurship;
10. demonstrate understanding of professional ethics, responsibilities and norms of electrical and electronic engineering practices;
11. function individually or in teams, effectively, with the capability to be a leader.

6.5.6 SYNOPSIS AND COURSE LEARNING OUTCOME (DEP)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
1	DET1013 Electrical Technology	ELECTRICAL TECHNOLOGY introduces students to the principles of DC electrical circuits. It covers the fundamental laws, theorems and circuit techniques. This course also covers magnetic and electromagnetic circuits. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the concept and principles of DC electrical circuit using different method and approach. (C3, PLO1) 2. solve DC circuit problems using appropriate DC electrical laws and theorems. (C3, PLO2) 3. conduct the laboratory activities of DC electrical circuit using appropriate electrical equipment. (P4, PLO5) 4. demonstrate ability to work in team to complete assigned task during practical work sessions. (A3, PLO11)
1	DET1022 Electrical Wiring	ELECTRICAL WIRING course exposes students to the aspects of wiring installation. Students will be able to relate theoretical aspect in practical work on electrical wiring during workshop sessions. This course provides the students with the knowledge and skill in doing different types of wiring installation, inspection and testing. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply the concept and principles of electrical safety and wiring in electrical wiring according to NIOSH and MS IEC 60364. (C3, PLO1) 2. solve problems related to single-phase domestic wiring failure according to MS IEC 60364. (C3, PLO2) 3. construct single-phase domestic wiring, wiring inspection & testing, and wiring protection according to MS IEC 60364. (P4, PLO5) 4. demonstrate understanding of engineering norms and practices in electrical wiring during practical work sessions. (A3, PLO10)
1	DEE1012 Measurement	MEASUREMENT introduces students to the basic concept of electrical instrument and measurement. It covers the basic principles of measurement, safety precautions and meter calibration. Students will also use measurement devices such as analogue meters, DC and AC meters, analogue and digital multimeters, oscilloscopes, signal generators and power meters during practical session. This course also covers the basic concept and simple application of DC Bridge. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply the concept of measurement principles and measuring equipment in electrical and electronic measurement. (C3, PLO1) 2. solve problems of electrical and electronic circuit using appropriate measuring operations and theorems. (C3, PLO2) 3. perform meter calibrating and measuring technique using the correct measuring equipment. (P4, PLO5) 4. demonstrate good written communication skill through essay writing in a group on assigned topics within a stipulated time frame. (A3, PLO6)

1	DUW1012 Occupational Safety And Health	OCCUPATIONAL SAFETY AND HEALTH course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of employers and employees in implementing and complying with the safety procedures at work. This course provide an understanding of the key issues in OSH management, incident prevention, Emergency Preparedness and Response (EPR), fire safety, occupational first aid, Hazard Identification, Risk Assessment and Risk Control (HIRARC) and guide the students gradually into this multi-disciplinary science. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. identify the OSH legislation and its compliance in Malaysia. (C2, LD1) 2. explain briefly incident hazards, risks and safe work practices in order to maintain health and safe work environment. (C2, LD1) 3. discuss cooperatively in responding to an accident action at workplace. (C3,LD1; A2,LD4) 4. adhere to the safety procedures in respective fields. (A3, LD8)
2	DET2033 Electrical Circuits	ELECTRICAL CIRCUITS designed to provide students with the knowledge of electrical circuits. It emphasizes the principles of an alternating current AC waveform and sinusoidal steady-state circuit analysis. This course also covers the applications of three phase system and operation of various types of transformers. **CREDIT(S) : 3** **PREREQUISITE(S) : DET1013 ELECTRICAL TECHNOLOGY**	1. apply the concept and principles of AC electrical circuit and their analysis using AC circuit law. (C3 , PLO1) 2. solve problems of AC electrical circuit using the appropriate AC electrical laws and theorems. (C3 , PLO2) 3. conduct the laboratory exercises of AC electrical circuit using appropriate electrical equipments. (P4 , PLO5) 4. demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3 , PLO11)
2	DEE2023 Semiconductor Devices	SEMICONDUCTOR DEVICES is an introduction to the basic electronic theories and devices. The course covers the fundamentals of electronic devices which includes diodes, bipolar junction transistors and field effect transistors. The content encompasses devices structure to biasing basic applications. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the concept and principles of theoretical characteristics and electrical properties of semiconductor devices. (C3, PLO1) 2. solve problems of semiconductor devices application circuits related to the operation and the characteristics of the circuits. (C3, PLO2) 3. construct and test the various applications of semiconductor devices circuit based on schematic diagrams. (P4, PLO5) 4. demonstrate good communication skill in oral presentation individually or in group, on assigned topics within a stipulated time frame. (A3, PLO6)

2	DEE2034 Digital Electronic	DIGITAL ELECTRONICS introduces the theories on the basic of digital systems. This course emphasizes on the digital system fundamentals and applications. This course mainly covers number systems, code systems, logic gates, Boolean operations, combinational circuits, flip-flops, counters and registers. **CREDIT(S) : 4** **PREREQUISITE(S) : NONE**	1. apply the knowledge of various number systems codes , logic operations and logic gates in digital systems. (C3, PL01) 2. design combinational or sequential logic circuits using Boolean Algebra or Karnaugh Map. (C5, PLO4) 3. manipulate the design of logic diagrams, truth tables and timing diagrams for logic gates and flip-flops and implement them in combinational and sequential logic circuits . (P4, PLO5)
2	DEC2012 Fundamental Programming	FUNDAMENTAL PROGRAMMING course provides the skills necessary for the effective of application of computation and computer programming in engineering applications. Students will develop their programming skills through a variety of assignments and labs and by reviewing case studies and example programs. The learning outcome is proficiency in writing small to medium programs in a procedural programming language. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply knowledge of basic concepts and fundamentals of structured programming. (C3, PLO1) 2. solve a variety of engineering and scientific problems using a high level programming language and apply critical thinking. (C3, PLO2) 3. construct, run and debug programs written in C language for assigned project during practical work sessions. (P4, PLO5) 4. demonstrate continuous learning and information management skill in independent acquisition of new knowledge and skill to develop a project. (A3, PLO8)
3	DEE3043 Electronic Circuits	ELECTRONIC CIRCUITS emphasizes the concept of electronic devices applications. The course covers the fundamental of electronic circuit applications which include power supply unit, filters, operational amplifier, timer, oscillator and AD/DA converters. The contents cover circuit configurations, operations and applications of the electronic circuits. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the theoretical concept and principles of electronic circuits to electronic devices by using block diagram or schematic circuit. (C3, PLO1) 2. solve problems related to electronic circuits operation using the theoretical concept of electronic circuits. (C3, PLO2) 3. construct and test various electronic circuits application based on the theory and principle operation of the circuits. (P4, PLO5) 4. demonstrate good communication skill in oral presentation individually on assigned topics within a stipulated time frame. (A3, PLO6)
3	DEE3052 Electronic Equipment Repair	ELECTRONIC CIRCUITS emphasizes the concept of electronic devices applications. The course covers the fundamental electronic circuit applications which include power supply unit, filters and operational amplifier, timer, oscillator, and AD/DA converters. The contents cover circuit configurations, operations and applications. **CREDIT(S) : 2** **PREREQUISITE(S) : DEE 2023 SEMICONDUCTOR DEVICES**	1. apply the knowledge of hand tools, soldering technique and test equipment in troubleshooting and repairing electronic equipment. (C3, PLO1) 2. solve problems related to electronic equipment repair using the correct diagnosis technique. (C3, PLO2) 3. fix the electronic equipment fault using the correct diagnosis technique. (P4, PLO5) 4. demonstrate an awareness of entrepreneurship in repairing the domestic electronic appliances through essay question within a stipulated time frame. (A3, PLO9)

3	DEE3061 Computer Aided Design	COMPUTER AIDED DESIGN provides knowledge and exposure on the usage of AutoCAD software. The course focuses on the application of the software to produce drawings of graphics, electrical / electronic component symbols, circuit schematics and electrical wiring layout diagram. The skills acquired from this course will also equip students with the ability to learn and use other similar software. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. apply computer aided design concept, applications and capabilities in electrical engineering environment. (C3, PL01) 2. manipulate the draw and edit commands and the various data input techniques in AutoCAD software to reproduce given simple and complex technical drawings. (P4, PLO5) 3. construct the technical graphics, electronic circuits schematics and electrical wiring layout diagrams using AutoCAD software based on American/British technical symbol standard. (P4, PLO5)
3	DEE3071 Electronic Computer Aided Design	ELECTRONIC COMPUTER AIDED DESIGN covers the general introduction to the basic concept and fundamentals of electronic simulation and the applications of electronic packages for electronic circuit simulation at the circuit level and the logic level. Attention is also given to the concept of simulation for analogue, digital logic and mixed-signal circuits using various types of simulation analysis using an electronic simulation package such as Protel / Altium Designer, ORCAD, PSpice, Circuit Maker or Electronic Workbench. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. analyze the simulation results for the various types of simulation analysis based on the electronic circuit theory and operations. (C4, PLO3) 2. construct the simulation of analogue and digital circuits with the correct input / output sources and simulation analysis using a schematic capture simulation software. (P4, PLO5) 3. construct the PCB design layout of the various circuits simulated using manual or automatic routing tool in a schematic capture simulation software. (P4, PLO5)
3	DEP3273 Communication System Fundamentals	COMMUNICATION SYSTEM FUNDAMENTALS introduces the students to the basic concepts of communication system. This course covers the principles of communications, analog and digital modulation techniques, multiplexing and transmission medium. It also covers basic data communication. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the basic concept of communication system elements, various types of modulation techniques, transmission system and basic data communication in electronic communication by using appropriate diagram. (C3, PLO1) 2. solve a well-defined problems related to noise parameters, modulation parameters, character encoding and information capacity using designated method and formula. (C3, PLO2) 3. construct and test various applications of related communication equipments in performing the assigned practical work using standard test equipment. (P4, PLO5) 4. demonstrate ability to work in a team to complete assigned tasks during practical work sessions. (A3, PLO11)

3	DEP3283 Telephony	TELEPHONY provides students with the basic knowledge of telephone network. This course introduces students to Public Switched Telephone Network (PSTN) and Next Generation Network (NGN). Students are exposed to transmission and signaling system in telephone network. This course also provides knowledge in basic principle of teletraffic engineering and telephone network services. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the basic concept of switching, transmission, signaling system in telephone network and various telephone services by using appropriate block diagram. (C3, PLO1) 2. solve related well-defined engineering problems related to line speed and teletraffic using designated formula. (C3, PLO2) 3. construct and test various applications of related communication equipments in performing the assigned practical work using standard test equipment. (P4, PLO5) 4. demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO11)
6	DUT40110 Industrial Training	**INDUSTRIAL TRAINING** exposes students to related workplace competencies demanded by industries. This course provides exposure to students in terms of technology literacy, effective communication, practice social skills and teamwork, policies, procedures and regulations, professional ethics and reporting. It also equips students with real work experience, thus helping students to perform as novice workers. **CREDIT(S) : 10** **PREREQUISITE(S) : NONE**	1. apply related knowledge and skills at the workplace. (C3, P2) 2. communicate effectively with others. (A3) 3. practice teamwork. (A5) 4. professionally and ethically comply with policies, procedures and rules of the organization. (A5) 5. explain the tasks assigned (during the industrial training) according to the prescribed format. (P2, A4)
4	DEE5081 Project 1	PROJECT 1 provides knowledge regarding the implementation and development methods of a project based on hardware **or** software **or** a combination of tools and software. This course provides exposure to the selection and early planning of a project, techniques to develop project, application of computer aided design as well as methods of preparing and presenting project. **CREDIT(S) : 1** **PREREQUISITE(S) : NONE**	1. conduct research in order to make improvements on a chosen project whether the project is on the hardware, the software or hardware-software interface and submit a proposal. (C3, PLO1) 2. plan project for the chosen category in a Gantt Chart form and deliver a presentation with a written final proposal within a given time frame. (C5,PLO4) 3. carry out project construction procedures (hardware project) or produce flowchart and draft algorithm for system programme (software project) systematically. (P4, PLO5) 4. demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop the chosen project. (A3, PLO8)

4	DEC5052 Embedded System Application	EMBEDDED SYSTEM APPLICATIONS covers the basic concept and application of microcontroller system based on Peripheral Interface Controller (PIC) microcontroller. Students will learn software and hardware development on PIC16F/PIC18F microcontroller development system and understand how to do interfacing with external devices using suitable internal chip features. Students are exposed to the new Microcontroller Unit (MCU) simulation software such as Proteus. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. apply suitable software and hardware development on PIC16F/PIC18F microcontroller system to interface with external devices using suitable internal chip features. (C3, PLO1) 2. design embedded system application based on PIC16F/PIC18F microcontroller effectively. (C5, PLO4) 3. construct and simulate real-time embedded system application based on PIC16F/PIC18F microcontroller effectively. (P4, PLO5) 4. demonstrate the ability to lead a team to complete assigned project / practical work within a stipulated time frame. (A3, PLO11)
4	DEP5293 Data Communication And Networking	DATA COMMUNICATION AND NETWORKING exposes the student to the principle of data communication and networking. This course covers basic concept of data communication and networking fundamental. Students are exposed to Open Systems Interconnection (OSI) Model and Network Protocol. Students are also introduced to public digital network. **CREDIT(S) : 3** **PREREQUISITE(S) : DEP3273 COMMUNICATION SYSTEM FUNDAMENTALS**	1. apply the concept and principles of data communication, networking, network protocol in data communication using appropriate diagram. (PLO1,C3) 2. analyze error detection and various digital-to-digital encoding in data communication and networking. (PLO3,C4) 3. construct and test various applications of related data communication and networking equipments in performing the assigned practical work using standard test equipment. (PLO5,P4) 4. demonstrate the ability to work in a team to complete assigned tasks during practical work sessions . (PLO11, A3)
4	DEP5303 Microwave Devices	MICROWAVE DEVICES introduces the existence, characteristic and the effect of electromagnetic wave to the surrounding. This course also focuses on the devices used in microwave communication system such as waveguide (transmission lines), basic accessories, sources, microwave antennas as well as the techniques of measurement used in microwave system. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. apply the knowledge of electromagnetic field and propagation to the operation of devices used in microwave system. (C3, PLO1) 2. analyze and investigate microwave propagation problems in transmission lines using Smith Chart or designated mathematical equations. (C4, PLO3) 3. display the ability to handle systematically the related microwave communication equipments while performing the practical works. (P4, PLO5) 4. demonstrate good communication skill in oral presentation, on assigned end of chapter within stipulated time frame. (A3,PLO6)

4	DEP5313 Fiber Optic Communication System	FIBER OPTIC COMMUNICATION SYSTEM introduces students to the basic concept of fiber optic communication systems. This course covers fiber optic characteristics, losses in fiber optic cable and the fundamental concept of optical measurement. This course also provides knowledge in splicing techniques, multiplexing techniques and design consideration in fiber optic communication system. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the concepts of light properties in the fiber optic communication system. (C3, PLO1) 2. Solve problems regarding light transmission in fiber optic communication link. (C3, PLO2) 3. Design fiber optic communication link using link budget. (C5, PLO4) 4. Display the ability to handle systematically the testing instruments for fiber optic communication system. (P4,PLO5)
5	DEE6092 Project 2	PROJECT 2 is the continuation of DEE5081 (Project 1) course. The course focuses on methods of circuit construction, testing, troubleshooting, debugging, repair and also completion of the project which was planned during the previous semester. This course also requires students to prepare a project report in a given format and deliver a project presentation at the end of the semester. **CREDIT(S) : 2** **PREREQUISITE(S) : DEE5081 PROJECT 1**	1. prepare an oral presentation of the project, in group or individually, inclusive of a final report written in a standard format with the necessary technical data referred to during project implementation. (C3, PLO1) 2. design project prototype (hardware project) with suitable and attractive casing or complete system programme (software project) with user interface. (C5,PLO4) 3. conduct circuit testing, troubleshooting and repair based on electrical circuit fault finding and operation theory (hardware project) or test run, debug and execute system programme (software project). (P4, PLO5) 4. display the awareness of entrepreneurial elements in the project produced. (A3 ,PLO9)
5	DEE6122 Signal And System	SIGNAL & SYSTEM provides knowledge on the signals and systems, the Linear Time-Invariant (LTI) systems, the Laplace transform, the z-transform and Fourier analysis. The course focuses on the mathematical description of signals and systems, the input-output relationship for Linear Time-Invariant (LTI) systems, the Laplace transform and z-transform and their application techniques for analysing the systems and Fourier analysis of signals and systems. **CREDIT(S) : 2** **PREREQUISITE(S) : DBM3023 ELECTRICAL ENGINEERING MATHEMATICS**	1. apply the concept and theory of signals and systems are needed in electrical and signal and system.(C3, PLO1) 2. solve problems related to signals and systems by using continuous-time signal and discrete-time signal. (C4, PLO2) 3. analyze continuous-time signal and discrete-time signal signals using related signal and system application .(C4, PLO3)

5	DEP6323 Wireless Communication	WIRELESS COMMUNICATION introduces students to wireless communication and standards. This course covers the multiple access techniques and fundamentals in wireless communication. It also covers cellular communication system particularly Global System for Mobile communication (GSM) and various wireless communication services. **CREDIT(S) : 3** **PREREQUISITE(S): NONE**	1. apply the knowledge of wireless standards, fundamentals, multiple access techniques in wireless communication system and various wireless communication services. (C3, PLO1) 2. solve related well-defined problems in frequency re-use, free-space propagation and two-ray model using designated formula.(C3, PLO2) 3. construct and test various applications of related wireless communication equipments in performing the assigned practical work using standard test equipment. (P4, PLO5) 4. demonstrate good communication skill in oral presentation, on assigned end of chapter question within a stipulated time frame. (A3, PLO6)

ELECTIVE			
5	DEC6122 Embedded Robotic	EMBEDDED ROBOTIC presents the combination of mobile robots and embedded systems, from introductory to intermediate level. It is structured in three parts, which are embedded systems, mobile robot, and mobile robot applications. These parts are essential to students in mastering the crucial steps of building a complete working robotic system. They will help them to develop robots that not only can move, but intelligent as well. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the concept and fundamentals of mobile robotic, embedded controller, sensors and actuators based on land mobile robot design. (C3, PLO1) 2. Analyze the concept of robot positioning, identification and communication in mobile robot control according to a standard robot organization regulation. (C4, PLO3) 3. Manipulate the application of sensor and actuator, robot identification and communication during practical work based on land mobile robot design. (P4, PLO5) 4. Demonstrate good communication skill in oral presentation and answer question with confidence for assigned topics within a stipulated time frame. (A3, PLO6)
5	DEC5082 Interactive Multimedia Application	INTERACTIVE MULTIMEDIA APPLICATIONS exposes students to the process of creating interactive multimedia presentations including the role of and design of multimedia systems which incorporate digital audio, graphics and video, underlying concepts and representations of sound, pictures and video, data compression and transmission, integration of media, multimedia authoring, and delivery of multimedia. Students will produce a final digital interactive multimedia projects **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the theory of recombination process in LED. (C3, PLO1) 2. Design LED based on electrical and optical properties. (C5, PLO4) 3.Demonstrate continuous learning and information management skill in independent acquisition of new knowledge and skill through case study. (A3,PLO8)
5	DEJ5153 Programmable Logic Controller (PLC) And Automation	PROGRAMMABLE LOGIC CONTROLLER (PLC) AND AUTOMATION provides knowledge regarding the concept and principle of automation system. This course emphasizes the relationship between hardwired relay ladder logic and PLC system, application of various industrial input and output devices of PLC, design process, programming and PLC maintenance method. This course also provides knowledge and skills in designing of controlling automation system based on PLC. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	1. Explain clearly blocks, parts, components and instructions found in the Automation systems. (C2, PLO1) 2. Design simple automation sequential control using electromechanical devices And PLC. (C5, PLO4) 3. Display the ability to do troubleshooting and maintenance of hardwired and plc Systems using appropriate equipment. (P4, PLO5) 4. Demonstrate understanding of plc automation system norm and standard Which are iec and nema standards during practical work session. (A3, PLO10)

5	DEP6332 Satellite And Radar Communication System	SATELLITE AND RADAR COMMUNICATION SYSTEM introduces students to the concepts of satellite and radar communication systems. This course gives the students an opportunity to understand the satellite orbits, space satellite subsystem, satellite communication system, radar fundamentals and different types of radar system. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	1. Apply the concepts of satellite and radar in communication systems. (C3, PLO1) 2. Solve well-defined problems related to satellite communication system and radar fundamentals by using the appropriate formula. (C3, PLO2) 3. Demonstrate good communication skill in oral presentation, on assigned essay question within a stipulated time frame. (A3, PLO6)

6.5.7 PROGRAMME STRUCTURE (DEP)

COURSE CODE	COURSE	L	P	T	C
SEMESTER 1					
DUB1012	Pengajian Malaysia	1	0	2	2
DUE1012	Communicative English 1	1	0	2	2
DRB1000	Asas Unit Beruniform	0	2	0	0
DUW1012	Occupational, Safety and Health	2	0	0	2
DBM1013	Engineering Mathematics 1	2	0	2	3
DBS1012	Engineering Science	2	1	0	2
DET1013	Electrical Technology	2	2	0	3
DET1022	Electrical Wiring	0	3	0	2
DEE1012	Measurement	1	2	0	2
	TOTAL	**25**			**18**
SEMESTER 2					
DUA2012	Sains Teknologi dan Kejuruteraan Islam*	1	0	2	2
DUB2012	Nilai Masyarakat Malaysia**	1	0	2	2
DRS2001	Sukan	0	2	0	1
DRB2001	Unit Beruniform 1	0	2	0	1
DBM2013	Engineering Mathematics 2	2	0	2	3
DET2033	Electrical Circuits	2	2	0	3
DEE2023	Semiconductor Devices	2	2	0	3
DEE2034	Digital Electronics	3	2	0	4
DEC2012	Fundamental Programming	1	2	0	2
	TOTAL	**25**			**18**
SEMESTER 3					
DUE3012	Communicative English 2	1	0	2	2
DRK3002	Kelab/Persatuan	0	4	0	2
DRB3002	Unit Beruniform 2	0	4	0	2
DEE3043	Electronic Circuits	2	2	0	3
DEE3052	Electronic Equipment Repair	1	3	0	2
DEE3061	Computer Aided Design	0	2	0	1
DEE3071	Electronic Computer Aided Design	0	2	0	1
DEP3273	Communication System Fundamentals	2	2	0	3
DEP3283	Telephony	2	2	0	3
	TOTAL	**27**			**17**

COURSE CODE	COURSE	L	P	T	C
SEMESTER 4					
DUE5012	Communicative English 3	1	0	2	2
DBM3023	Electrical Engineering Mathematics	2	0	2	3
DEC5052	Embedded System Application	1	2	0	2
DEP5293	Data Communication and Networking	2	2	0	3
DEP5303	Microwave Devices	2	2	0	3
DEP5313	Fibre Optic Communication System	2	2	0	3
DEE5081	Project 1	0	2	0	1
	TOTAL	**24**			**17**
SEMESTER 5					
DUA6022	Komunikasi dan Penyiaran Islam	1	0	2	2
DPB2012	Entrepreneurship	2	1	0	2
DEP6323	Wireless Communication	2	2	0	3
DEE6122	Signal and System	2	0	1	2
DEE6092	Project 2	0	3	0	2
	Elective 1***	1	2	0	2
	Elective 2***	1	2	0	2
	TOTAL	**22**			**15**
	GRAND TOTAL				**95**
SEMESTER 6					
DUT40110	Industrial Training	**10**			

*** Students can select any of the elective courses that are offered by the department. Students are required to take a minimum of four credits of elective course.

COURSE CODE	COURSE	L	P	T	C
***Elective					
DEC5082	Interactive Mutimedia Applications	1	2	0	2
DEC6122	Embedded Robotic	1	2	0	2
DEJ5153	Programmable Logic Controller	2	2	0	3
DEP6332	Satellite And Radar Communication System	2	0	0	2

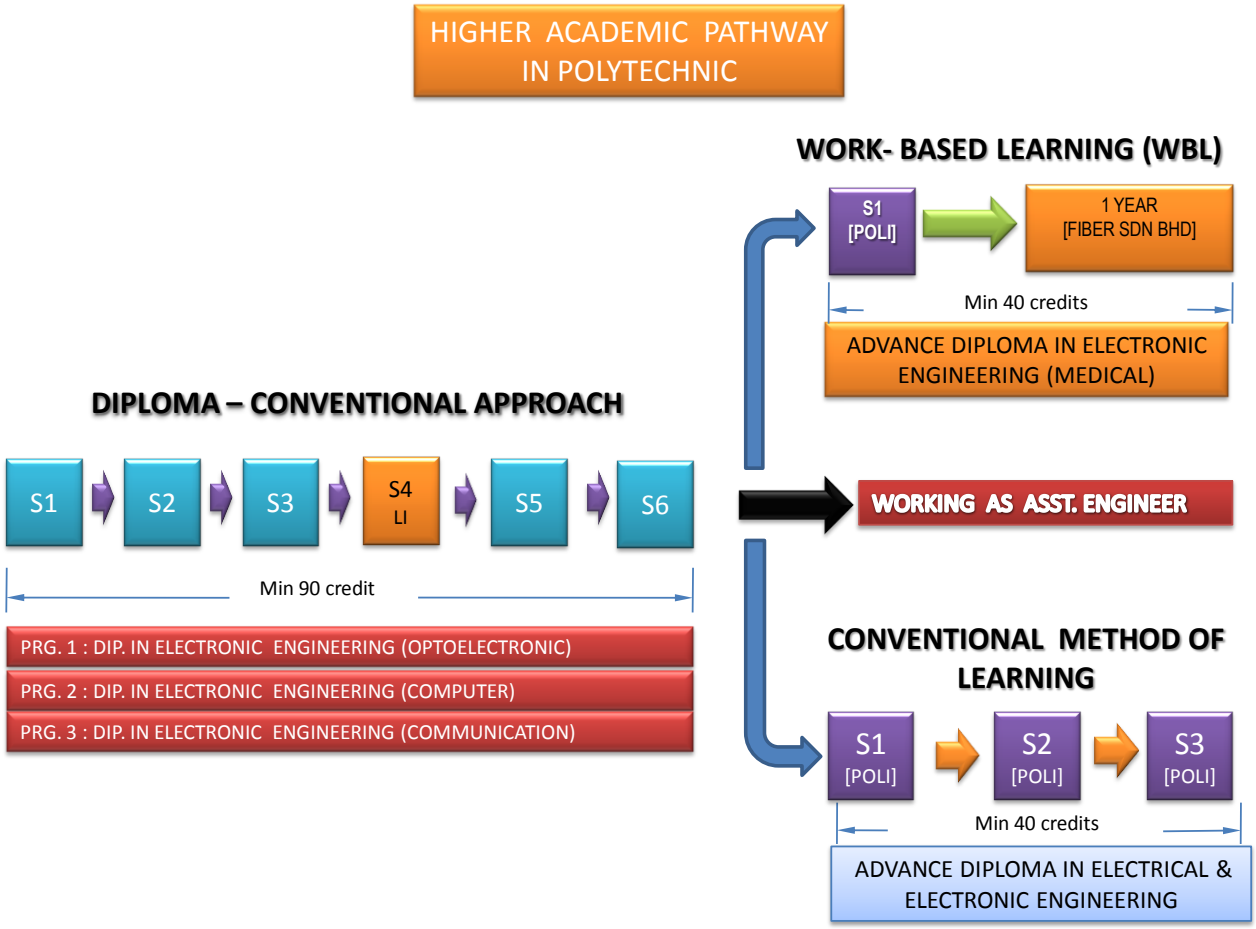
L : LectureT : TutorialP : Practical/LabC : Credit

6.6 LAB FACILITIES IN ELECTRICAL DEPARTMENT

Name	Quantity	Lab Supervisor
Electrical Technology Laboratory (*Makmal Teknologi Elektrik* – ETE)	1	Nur Farhani Imelda Binti Abdullah
Electronic Laboratory (*Makmal Elektronik* – EEE)	1	Rodziah Binti Ismail
Measurement Laboratory (*Makmal Pengukuran Teknologi* – EMU)	1	Azrini Binti Idris
Electronic Equipment Repair Laboratory (*Makmal Baikpulih Alatan Elektronik* - EBE)	1	Mohamed Isa Bin Osman
Electrical Principle Laboratory (*Makmal Prinsip Elektrik* – EPE)	1	Shahrul Radzi Bin Mad Zaki @ Abdullah
Computer Repair Laboratory (*Makmal Baikpulih Komputer* – EBK)	1	Nurul Huda Binti Hanzah
Project Laboratory (*Makmal Projek* – EPR)	1	Ahmad Fakhrul Zaman Bin Mohd Ariffin King Diaw A/L Eh Sut
Installation and Wiring Workshop (*Makmal Pendawaian dan Pemasangan* – EPP)	1	Izwan Bin Che Sham Ku Mohammad Yusri Bin Ku Ibrahim

Name	Quantity	Lab Supervisor
Optoelectronic Laboratory (*Makmal Optoelektronik* – OPTO)	1	Umahwathy A/P Sundaraju
		Faridah Binti Othman
Telecommunication Laboratory (*Makmal Telekomunikasi* – ETL)	1	Nor Zaidah Binti Mohd Zahari
		Fariza Binti Ishak
Data Communication Laboratory (*Makmal Komunikasi Data* – EPD)	1	Noor Amani Binti Salleh
Computer Hardware Laboratory 1 (*Makmal Perkakasan Komputer 1* – EPK1)	1	Shamsul Anuar Bin Abdul Aziz
Computer Hardware Laboratory 2 (*Makmal Perkakasan Komputer 2* – EPK2)	1	Mohd Radhi Bin Musa
ECAD Laboratory 1 (*Makmal ECAD 1* – ECAD 1)	1	Nor Hazlinda Binti Idris
ECAD Laboratory 2 (*Makmal ECAD 2* – ECAD 2)	1	Sarah Binti Jewahid
Computer Programming Laboratory 1 (*Makmal Pengaturcaraan Komputer 1* – PRG 1)	1	Sa'adiah Binti Mohamad
Computer Programming Laboratory 2 *(Makmal Pengaturcaraan Komputer* 2 – PRG 2)	1	Siti Rohani Binti Abu Bakar

6.7 HIGHER ACADEMIC PATHWAY



Advance Diploma Programme

POLITEKNIK MALAYSIA SULTAN SALAHUDDIN ABDUL AZIZ SHAH	• Advance Diploma in Electronic Engineering (Medical) • Bachelour Of Electronic Engineering (Medical Electronic) with Honours.	Politeknik Sultan Salahuddin Abdul Aziz Shah Politeknik Premier, Seksyen U1, Persiaran Usahawan, 40150, Shah Alam. Selangor. Telefon : +603-5163 4000 Faks:+603-5569 1903 Web : www.psa.edu.my

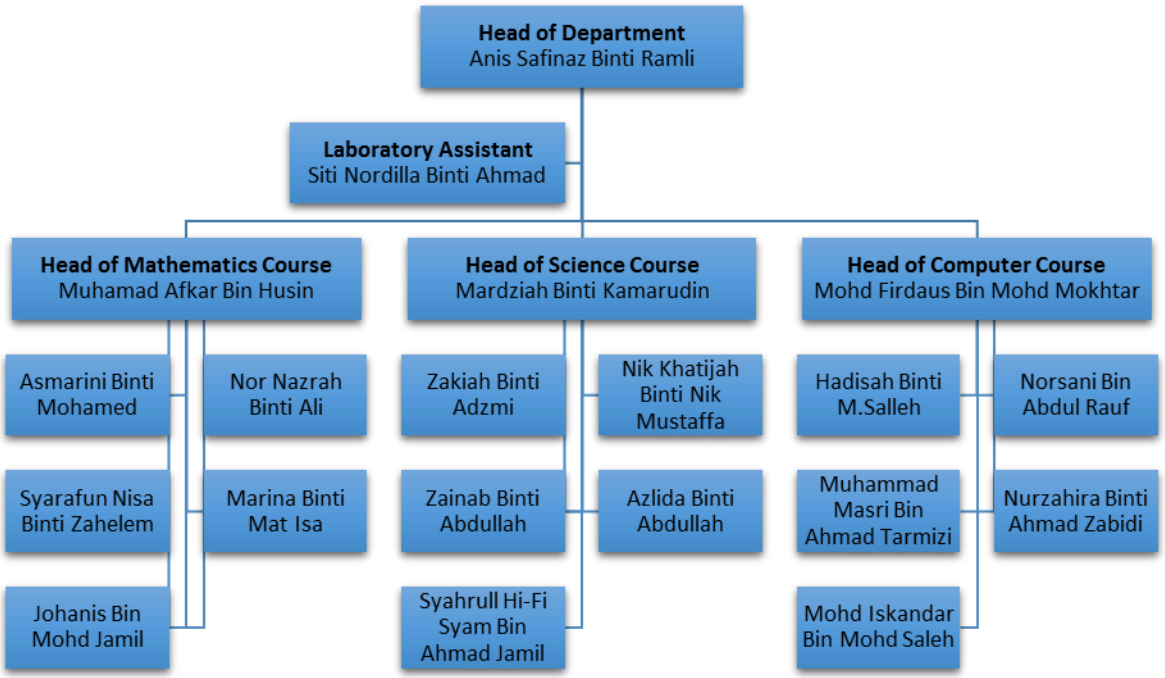
Malaysian Technical University Network (MTUN)

	• Bachelor of Electrical Engineering with Honours • Bachelor of Electrical Engineering (Power Systems) with Honours • Bachelor of Electronic Engineering (Computer Engineering) with Honours • Bachelor of Electronic Engineering (Communication) with Honours • Bachelor of Electronic Engineering (Mechatronics) with Honours	Timbalan Pendaftar Kanan Pejabat Pengurusan Akademik Universiti Tun Hussein Onn Malaysia 86400 Parit Raja, Batu Pahat Johor Tel : 07-4537681/ 7655/ 7687/ 7689/ 7694 Faks : 07-4536085 Emel : pa@uthm.edu.my Web : www.uthm.edu.my
UTeM	• Bachelor of Electrical Engineering (Industrial Power) • Bachelor of Electrical Engineering (Power Electronic & Drive) • Bachelor of Electrical Engineering (Control, Instrumentation & Automation) • Bachelor of Mechatronics Engineering	Bahagian Pengurusan Akademik Universiti Teknikal Malaysia Melaka Karung Berkunci 1752 Pejabat Pos Durian Tunggal 76109 Durian Tunggal MELAKA Tel : 06-3316086/ 6078/ 6077/ 6073/ 6076 Faks : 06-3316079 Emel : bpa@utem.edu.my Web : www.utem.edu.my
	• Bachelor of Electrical Engineering (Control & Instrumentation) • Bachelor of Electrical Engineering (Electronics) • Bachelor of Electrical Engineering (Power System) • Bachelor of Computer Science (Software Engineering) • Bachelor of Computer Science (Graphics & Multimedia Technology) • Bachelor of Computer Science (Computer Systems & Networking)	Bahagian Pengurusan Akademik Kompleks Perkhidmatan Siswa Universiti Malaysia Pahang Karung Berkunci 12 25000 Kuantan Pahang Darul Makmur Tel : 09-549 2550/ 2557 Faks : 09-549 2555Emel : - Web : www.ump.edu.my
	• Bachelor Engineering in Computer Engineering • Bachelor Engineering in Communication Engineering • Bachelor Engineering in Computer Network Engineering • Bachelor Engineering in Microelectronic Engineering • Bachelor Engineering in Electronic Engineering • Bachelor of Engineering in Photonic Engineering • Bachelor Engineering in Biomedical Electronic Engineering • Bachelor Engineering in Electrical Systems Engineering • Bachelor Engineering in Industrial Electronic Engineering	Pendaftar Bahagian Pengurusan Akademik Jabatan Pendaftar Universiti Malaysia PerlisNo. 34 & 35 Bersebelahan Hong Leong Bank, Jalan Bukit Lagi,01000 Kangar Perlis Tel : 04-9798701/ 8702/ 8706 Faks : 04-9798703 Emel :kemasukan@unimap.edu.my Web : www.unimap.edu.my

SUPPORTING DEPARTMENTS & UNITS

7.1 MATHEMATICS, SCIENCE AND COMPUTERDEPARTMENT (JMSK)

7.1.1 ORGANISATION CHART



7.1.2 MATHEMATICS, SCIENCE AND COMPUTER DEPARTMENT LECTURERS

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3	Mardziah Binti Kamarudin	Head of Science Course	04-9881376	mardziahk.poli@1govuc.gov.my
4	Mohd Firdaus Bin Mohd Mokhtar	Head of Computer Course	04-9881377	firdausmokhtar.poli@1govuc.gov.my
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9	Marina Binti Mat Isa	Lecturer	04-9886395	marinaisa@ptss.edu.my
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17	Syarafun Nisa Binti Zahelem	Lecturer	04-9886395	syarafunnisa.poli@1govuc.gov.my
18	Zainab Binti Abdullah	Lecturer	04-9886398	zainababdullah.poli@1govuc.gov.my
19	Zakiah Binti Adzmi	Lecturer	04-9886398	zakiah.adzmi.poli@1govuc.gov.my
20	Siti Nordilla Binti Ahmad	Laboratory Assistant	04-9886392	sitinordilla.poli@1govuc.gov.my

7.1.3 COURSE LEARNING OUTCOME (JMSK)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
1	DBM1013 Engineering Mathematics 1	ENGINEERING MATHEMATICS 1 exposes students to the basic algebra, which includes constructing partial fractions. This course also exposes the concept of trigonometry and the methods of solving trigonometry problems by using basic identities, compound angle and double angle formula. Students will be introduced to the theory of complex numbers and matrices to solve simultaneous equation. This course also introduces students to concept of vector and scalar. **CREDIT (S): 3** **PREREQUISITE (S): NONE**	Upon completion of this course, students should be able to: 1. Identify mathematical methods in solving the mathematical problems. (C2, LD1) 2. Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1) 3. Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)
1	DBS1012 Engineering Science	ENGINEERING SCIENCE is an applied science with theoretical concepts and practical learning sessions that can be applied in the engineering fields. This course focuses on the Physical Quantities, Measurement, Linear Motion, Force, Work, Energy, Power, Solid, Fluid, Temperature and Heat. **CREDIT (S): 2** **PREREQUISITE (S): NONE**	Upon completion of this course, students should be able to: 1. Solve the basic engineering science problems by using related concept. (C3, LD1) 2. Organise an appropriate experiments to prove related physic principles. (P3, LD2) 3. Apply related physic principles in various situations to enhance knowledge. (C3, LD1)
2	DBM2013 Engineering Mathematics 2	ENGINEERING MATHEMATICS 2 exposes students to the basic laws of exponents and logarithms. This course also introduces the basic rules of differentiation concept to solve problems that relate maximum, minimum and calculate the rate of changes. This course also discuss the integration concept in order to strengthen student knowledge for solving area and volume bounded region problems. In addition, students also will learn application of both techniques of differentiation and integration. **CREDIT (S): 3** **PREREQUISITE (S): NONE**	Upon completion of this course, students should be able to: 1. Solve the mathematical problems by using appropriate mathematical techniques and solutions. (C3, LD1) 2. Show the solution for differentiation and integration problem by using appropriate method. (C3, LD1) 3. Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
4	DBM3023 Electrical Engineering Mathematics	ELECTRICAL ENGINEERING MATHEMATICS 3 exposes students to the statistical and probability concepts and their applications in interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed Point Iteration methods and Newton Raphson method. In additional, the course also discuss Laplace Transform by using the Table of Laplace. In order to strengthen the students in solving advanced engineering problems, Ordinary Differential Equation (ODE) is also included. **CREDIT (S): 3** **PREREQUISITE (S): DBM2013 ENGINEERING MATHEMATICS 2**	Upon completion of this course, students should be able to: 1. Solve the mathematical problems by using appropriate mathematical technique and solution. (C3, LD1) 2. Show the solution for statistical and probability problems and Laplace Transformation by using related mathematical methods. (C3, LD1) 3. Practice mathematical knowledge and skills in different mathematical problem. (C3, LD1)

7.1.4 MATRIX OF COURSE ASSESSMENT (JMSK)

Code & Course	Quiz		Test		Tutorial Exercise		Assignment		Final Exam
	Qty	%	Qty	%	Qty	%	Qty	%	%
DBM1013 Engineering Mathematics 1	2	10	1	15	4	20	2	15	40
DBM2013 Engineering Mathematics 2	2	10	1	15	3	15	2	20	40
DBM3023 Electrical Engineering Mathematics	2	10	1	15	4	20	2	15	40

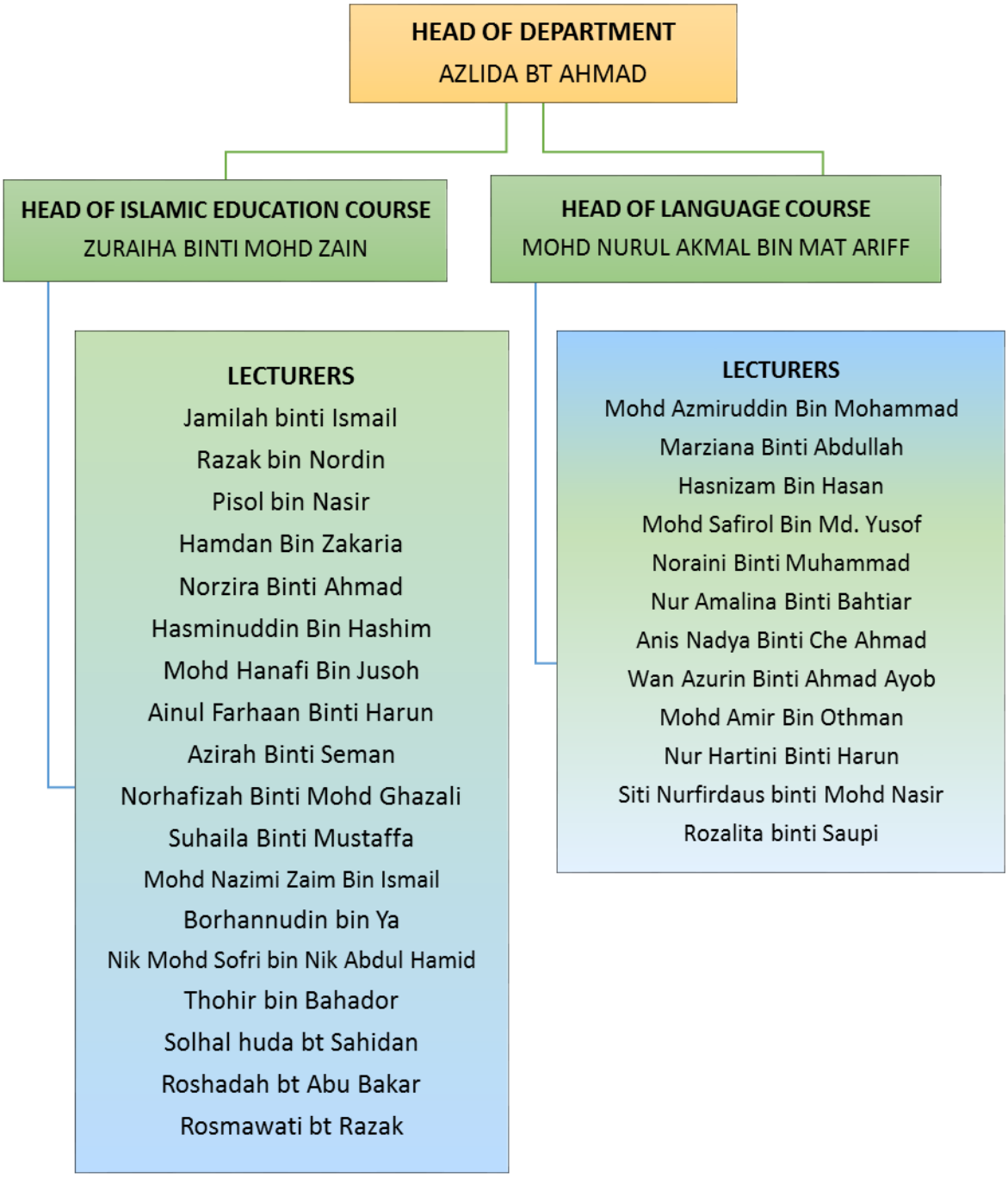
Code & Course	Quiz		Theory Test		Lab Work		Theoretical Exercise		Final Exam
	Qty	%	Qty	%	Qty	%	Qty	%	%
DBS1012 Engineering Science	1	5	1	15	4	30	2	10	40

7.1.5 LAB FACILITIES (JMSK)

Name	Quantity	Lab Supervisor
Science Laboratory	1	Zakiah Binti Adzmi
CAD Laboratory 1	1	Mohd Iskandar Bin Mohd Saleh
CAD Laboratory 2	1	Mohd Iskandar Bin Mohd Saleh
CAD Laboratory 3	1	Muhammad Masri Bin Ahmad Tarmizi
Class Room AK1	1	Zainab Binti Abdullah
Class Room 59 & 60	2	Syarafun Nisa Binti Zahelem
Class Room 61	1	Syahrull Hi-Fi Syam Bin Ahmad Jamil
Class Room 62	1	Zakiah Binti Adzmi
Class Room 63	1	Mohd Iskandar Bin Mohd Saleh

7.2 GENERAL STUDIES DEPARTMENT (JPA)

7.2.1 ORGANISATION CHART



7.2.2 GENERAL STUDIES DEPARTMENT LECTURERS

No.	Name	Designation	Contact No.	E-mail
1	Azlida Binti Ahmad	Head of Department	04-9886277	azlidaahmad.poli@1govuc.gov.my
2	Jamilah Binti Ismail	Senior Lecturer	04-9886242	jamilahis.poli@1govuc.gov.my
3	Mohd Azmiruddin Bin MOhammad	Senior Lecturer	04-9886274	mdazmir66@gmail.com
4	Marziana Binti Abdullah	Senior Lecturer	04-9886274	marzianabdullah.poli@1govuc.gov.my
5	Razak Bin Nordin	Senior Lecturer	04-9886276	razaknordin.poli@1govuc.gov.my
6	Pisol bin Nasir	Senior Lecturer	04-9886274	Ibnunasr_jpa@yahoo.com
7	Mohd Nurul Akmal Bin Mat Ariff	Head of Unit	04-9881652	mohdnurulakmal.poli@1govuc.gov.my
8	Zuraiha Binti Mohd. Zain	Head of Unit	04-9881653	zuraiha.poli@1govuc.gov.my
9	Hamdan Bin Zakaria	Lecturer	04-9886273	hamdanzakaria.poli@1govuc.gov.my
10	Norzira Binti Ahmad	Lecturer	04-9886275	norziraahmad.poli@1govuc.gov.my
11	Hasnizam Bin Hasan	Lecturer	04-9886274	hasnizamhasan.poli@1govuc.gov.my
12	Hasminuddin Bin Hashim	Lecturer	04-9886274	hasminuddin.poli@1govuc.gov.my
13	Mohd Hanafi Bin Jusoh	Lecturer	04-9886272	mohdhanafijusoh.poli@1govuc.gov.my
14	Ainul Farhaan Binti Harun	Lecturer	04-9886273	ainulfarhaan.poli@1govuc.gov.my
15	Azirah Binti Seman	Lecturer	04-9886276	azirahseman.poli@1govuc.gov.my
16	Norhafizah Binti Mohd Ghazali	Lecturer	04-9886276	nor.hafizah.poli@1govuc.gov.my
17	Nur Hartini Binti Harun	Lecturer	04-9881656	nurhartiniharun.poli@1govuc.gov.my
18	Mohd Safirol Bin Md Yusof	Lecturer	04-9886276	mohdsafirol.poli@1govuc.gov.my
19	Noraini Binti Muhammad	Lecturer	04-9886273	norainimuhammad.poli@1govuc.gov.my
20	Nur Amalina Binti Bahtiar	Lecturer	04-9881657	amalinabahtiar.poli@1govuc.gov.my
21	Suhaila Binti Mustaffa	Lecturer	04-9886276	suhailamustaffa.poli@1govuc.gov.my
22	Anis Nadya Binti Che Ahmad	Lecturer	04-9881657	anisnadya.poli@1govuc.gov.my
23	Mohd Nazimi Zaim Bin Ismail	Lecturer	04-9881656	mohdnazimizaim.poli@1govuc.gov.my
24	Wan Azurin Binti Ahmad Ayob	Lecturer	04-9886273	wanazurin.poli@1govuc.gov.my
25	Nik Mohd Sofri Bin Nik Abdul Hamid	Lecturer	04-9886273	nikmohdsofri.poli@1govuc.gov.my
26	Borhannudin Bin Ya	Lecturer	04-9886273	borhannudinya.poli@1govuc.gov.my
27	Mohd Amir Bin Othman	Lecturer	04-9886276	mohdamirothman.poli@1govuc.gov.my
28	Thohir Bin Bahador	Lecturer	04-9881657	thohirbahador.poli@1govuc.gov.my
29	Solhal huda bt Sahidan	Lecturer	04-9886275	solhalhuda@gmail.com
30	Roshadah bt Abu Bakar	Lecturer	04-9886276	Roshadah5058@gmail.com

No.	Name	Designation	Contact No.	E-mail
31	Rosmawati bt Razak	Lecturer	04-9886276	Wardati83@yahoo.com
32	Siti Nurfirdaus Binti Mohd Nasir	Lecturer	04-9881657	sitinurfirdaus.poli@1govuc.gov.my
33	Rozalita Binti Saupi	Lecturer	04-9881657	rozalitasaupi.poli@1govuc.gov.my

7.2.3 COURSE LEARNING OUTCOME (JPA)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
1	DUB1012 Pengajian Malaysia	PENGAJIAN MALAYSIA memupuk penghayatan ke arah melahirkan generasi yang cintakan negara. Kursus ini juga dapat mendidik kelompok masyarakat yang mempunyai daya juang yang tinggi dan mampu menghadapi cabaran di peringkat antarabangsa. Kursus ini memberi penghayatan tentang sejarah dan politik, perlembagaan Malaysia, kemasyarakatan dan perpaduan, pembangunan negara dan isu-isu keprihatinan negara. Objektif kursus ini adalah untuk melahirkan warganegara yang setia dan cintakan negara, berwawasan serta bangga menjadi rakyat Malaysia. **KREDIT : 2** **PRASYARAT : TIADA**	1. Menerangkan dengan baik sejarah bangsa dan negara. (C2, LD1) 2. Menjelaskan Perlembagaan Malaysia dan sistem pemerintahan negara. (C2, LD1) 3. Melaksanakan aktiviti berkaitan kenegaraan ke arah peningkatan patriotisme pelajar. (C3, LD1 : A3,LD6)
1	DUE1012 Communicative English 1	COMMUNICATIVE ENGLISH 1 focuses on speaking skills for students to develop the ability to communicate effectively and confidently in group discussions and in a variety of social interactions. It is designed to provide students with appropriate reading skills to comprehend a variety of texts. It is also aimed to equip students with effective presentation skills. **CREDIT(S) : 2** **PRE REQUISITE(S) : NONE**	1. Apply appropriate communication skills in discussions and conversations. 2. (C3) 3. Respond to selected texts using appropriate reading skills.(C2) 4. Respond to current issues / topics of interest in written form. (C2) 5. Apply effective presentation skills.(C3, A3)
2	DUA2012 Sains, Teknologi dan Kejuruteraan Dalam Islam	**SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM** memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaiannya dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya. **KREDIT : 2** **PRASYARAT : TIADA**	Di akhir kursus ini, pelajar akan dapat : 1. Menghuraikan konsep Islam sebagai cara hidup. (C2, LD1 : P2, LD2) 2. Menjelaskan konsep sains, teknologi dan kejuruteraan dalam Islam. (C2, LD1) 3. Membincangkan prinsip syariah dan kaedah fiqh dalam sains, teknologi dan kejuruteraan. (C3, LD1 : A3, LD6)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
2	DUB2012 Nilai Masyarakat Malaysia	**NILAI MASYARAKAT MALAYSIA** membincangkan aspek sejarah pembentukan masyarakat Malaysia, nilai-nilai agama serta adat resam dan budaya masyarakat majmuk. Selain itu, pelajar diberi kefahaman mengenai tanggungjawab individu dalam kehidupan dan cabaran-cabaran dalam membangunkan masyarakat Malaysia. **KREDIT : 2** **PRASYARAT : TIADA**	Di akhir kursus ini, pelajar akan dapat: 1. Menerangkan sejarah pembentukan masyarakat dan nilai agama di Malaysia. (C2 : LD1) 2. Menghubung kait tanggungjawab individu dalam kehidupan masyarakat dan negara. (C3 : LD1, A2 : LD5) 3. Membincangkan cabaran-cabaran dalam membangunkan masyarakat Malaysia. (C3 : LD1, A3 : LD6)
3	DUE3012 Communicative English 2	**COMMUNICATIVE ENGLISH 2** emphasises the skills required at the workplace to describe products or services as well as processes or procedures. It also focuses on the skills to give and respond to instructions. This course will also enable students to make and reply to enquiries and complaints. **CREDIT(S) : 2** **PREREQUISITE(S) : DUE1012 COMMUNICATIVE ENGLISH 1**	Upon completion of this course, students should be able to: 1. describe products or services related to their field of studies using appropriate language. (C3, A3) 2. transfer information on processes or procedures using appropriate language from non-linear to linear form. (C3) 3. listen and respond to enquiries using appropriate language.(C3) 4. make and respond to complaints using appropriate language.(C3)
5	DUE5012 Communicative English 3	**COMMUNICATIVE ENGLISH 3** aims to develop the necessary skills in students to carry out a mini project as well as job hunting. Students will learn to present ideas through the use of graphs and charts. Students will learn the process of job hunting which includes job search strategies and making enquiries. They will also learn to write resumes and cover letters. The students will develop skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews. **CREDIT(S) : 2** **PREREQUISITE(S) : DUE3012 COMMUNICATIVE ENGLISH 2**	Upon completion of this course, students should be able to: 1. describe information contained in graphs and charts effectively. (C4, A3) 2. apply job hunting mechanics appropriately. (C3) 3. respond to interview questions using appropriate language when applying for jobs. (C3)

SEMESTER	COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
5 & 6	DUA6022 Komunikasi dan Penyiaran Islam	**KOMUNIKASI DAN PENYIARAN ISLAM** memfokuskan kepada penguasaan konsep, kemahiran komunikasi dan penyiaran Islam bagi meningkatkan kefahaman pelajar secara holistik terhadap kursus ini. **KREDIT : 2** **PRASYARAT : TIADA**	Di akhir kursus ini, pelajar akan dapat: 1. Menjelaskan konsep komunikasi dan penyiaran dalam Islam. (C2 : LD1) 2. Menghubung kait isu-isu semasa dalam komunikasi Islam. (C3, A4 : LD1, LD5) 3. Menunjukkan kemahiran pengurusan dakwah dalam bidang penyiaran Islam. (C3, A3 : LD1, LD6)

7.2.4 MATRIX OF COURSE ASSESSMENT (JPA)

SEMESTER	CODE & COURSE	TYPES OF ASSESSMENT													
1	DUB1012 Pengajian Malaysia	Quiz		Presentation		Group Discussion		E-Folio		Listening Test		Role Play		Final Exam	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		2	20	1	20	-	-	1	30	-	-	-	-	1	30
1	DUE1012 Communicative English 1	Quiz		Presentation		Group Discussion		Role Play		Listening Test		Test		Final Exam	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		1	10	1	30	1	20	-	-	1	20	1	20	-	-
2	DUA2012 Sains,Teknologi dan Kejuruteraan Dalam Islam	Quiz		Test		Practical		E-Folio		Listening Test		Project		Final Exam	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		2	20	-	-	1	20	1	30	-	-	1	30	-	-
2	DUB2012 Nilai Masyarakat Malaysia	Quiz		Test		Practical		E-Folio		Listening Test		Project		Final Exam	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		2	20	-	-	-	-	1	30	-	-	2	50	-	-
3	DUE3012 Communicative English 2	Quiz		Test		Presentation		Assignment		Listening Test		Role Play		Final Exam	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		-	-	1	20	1	30	1	20	1	10	1	20	-	-
5	DUE5012 Communicative English 3	Quiz		Test		Presentation		Written Task		Listening Test		Mock Interview		Final Exam	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		-	-	1	20	1	30	2	20	-	-	1	30	-	-
6	DUA6022 Komunikasi dan Penyiaran Islam	Quiz		Test		Presentation		Written Task		Listening Test		Project		Final Test	
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
		2	20	-	-	1	20	-	-	-	-	1	30	1	30

7.2.5 LAB FACILITIES (JPA)

Name	Quantity	Laboratory Supervisor
Language Laboratory	1	**Language Laboratory 1** Mohd Amir bin Othman Mohd Azmiruddin Bin Mohammad
	1	**Language Laboratory 2** Mohd Amir bin Othman Mohd Safirol bin Md Yusof
	1	**Language Laboratory 3** Mohd Amir bin Othman Wan Azurin Binti Ahmad Ayob

7.3 CO-CURRICULUM UNIT

Function	Contact Personnel	Contact No
Co-Curriculum Unit is responsible for managing and coordinating all co-curriculum courses in PTSS. It is designed to ensure that all co-curriculum courses to be implemented smoothly and effectively.	**En. Bustamam Bin Bonari** DH48 Head of Department **En. Johanis Bin Mohd Jamil** DH44 Head of Cocurriculum	Ext : 1988 Ext : 1989

7.3.1 DRX 1000 / DRX 2001 / DRX 3002 / DRX 5000 / DRX 6000 – UNIFORMS

The new syllabus for Uniforms unit has came up with new course structures. Students who has the interest in joining the uniforms unit will be required to complete the whole programme which starts from the first semester untill the last semester.

This course emphasizes on the basic skills of team work which includes marching, first aid, fire prevention, protocol and social etiquette, self management and self esteem.

CODE	SEMESTER
DRX 1000 – General Code register in SPMP Specific Code register in i-koko : DRB 1010 – Askar Wataniah DRB 1050 – PISPA DRB 1090 – RELASIS	1
DRX 2001 – General Code register in SPMP Specific Code register in i-koko : DRB 2011 – Askar Wataniah 1 DRB 2051 – PISPA 1 DRB 2091 – RELASIS 1	2
DRX 3002 – General Code register in SPMP Specific Code register in i-koko : DRB 3012 – Askar Wataniah 2 DRB 3052 – PISPA 2 DRB 3092 – RELASIS 2	3

DRX 5000 – General Code register in SPMP Specific Code register in i-koko : DRB 5010 – Askar Wataniah 3 DRB 5050 – PISPA 3 DRB 5090 – RELASIS 3	5
DRX 6000 – General Code register in SPMP Specific Code register in i-koko : DRB 6010 – Askar Wataniah 3 DRB 6050 – PISPA 4 DRB 6090 – RELASIS 3	6

7.3.2 DRX 2001: SPORTS (SEMESTER 2) – GENERAL CODE REGISTER (i-daftar)

DRS 2* :** SPECIFIC CODE REGISTER **(i-koko)**

DRS 2001 are compulsory to be selected by semester 2 students **who did not choose** the uniforms unit in **SEMESTER 1**. General code for this is DRS 2001. There are 17 sports activity offered every semester. The lists are as shown in the table below :

SPORTS	CODE
BADMINTON	DRS2011
BOLA JARING	DRS 2031
BOLA KERANJANG	DRS 2041
BOLA SEPAK	DRS 2051
BOLA TAMPAR	DRS 2061
CATUR	DRS 2071
DART	DRS 2081
HOKI	DRS 2101
PING PONG	DRS 2151
RAGBI	DSR 2161
SEPAK TAKRAW	DRS 2181
SILAT	DRS 2190
SKUASY	DRS 2201
TAE KWON DO	DRS 2221
TENIS	DRS 2231
FUTSAL	DRS 2261
PETANQUE	DRS 2291
RAGBI SENTUH	DRS 2351
PERMAINAN TRADISIONAL	DRS 2361

7.3.3 **DRX 3002 – CLUBS (SEMESTER 3)** – GENERAL CODE REGISTER **(i-daftar)**

DRK 3* ** : SPECIFIC CODE REGISTER **(I-KOKO)**

DRK 3002 are compulsory to be selected by semester 3 students who successfully pass **DRS 2001 - SPORTS** in SEMESTER 2. General code for this is DRK 3002. There are 11 CLUBS AND SOCIETIES activity offered every semester. The lists are as shown in the table below :

CLUBS	CODE
AUDIO VISUAL	DRK 3022
BAHASA INGGERIS	DRK 3032
FOTOGRAFI	DRK 3052
KAUNSELING	DRK 3072
KEMBARA	DRK 3082
KEUSAHAWANAN	DRK 3092
KOMPUTER	DRK 3112
NASYID	DRK 3142
PENGGUNA	DRK 3152
STUDY CIRCLE	DRK 3162
TARIAN TRADISIONAL	DRK 3172
TARANNUM	DRK 3232
BAHASA ARAB	DRK 3252

SUPPORTING SERVICES

8.0 SUPPORTING SERVICES

8.1 STUDENT AFFAIRS DEPARTMENT (HEP)

Our role is to contribute to the mission of Politeknik Tuanku Syed Sirajuddin (PTSS) by partnering with other academic and administrative units to provide professional, creative, accessible, and high-quality services. To fulfill this role, Student Affairs Department seeks to create an environment that is caring and positive for students; practice champion cultural sensitivity and inclusiveness; provide coordinated services to ensurethe student-focused and technologically up to date; and respond positively to change.

Our vision is to eliminate barriers and create opportunities that enable all students to experience success. Our actions are guided by these values:

- the well-being of all students
- innovation in problem solving
- the positive affirmation of student achievement
- professionalism and ethical behavior
- cooperative and collaborative efforts that include enthusiasm, respect, and humor

To accomplish our mission, Student Affairs Department has established the following goals:

- increase retention and completion rates of students
- develop capacity to deliver services to all campus sites
- institute data-driven analysis for planning and decision-making
- improve attitudes toward and participation in student activities and services
- increase new student enrollment at class, overall and in specified programs

Function	Contact Personnel	Contact No
The Student Affairs Department is responsible for managing : a. student admission and registration b. scholarships c. residential College d. discipline and student behaviour e. registration of students' vehicle f. students activities through club / soceity g. alumni h. Student Representatives Committee (MPP) i. student insurance	**Mohd Ruslan Bin Salikin** (Head of Department) DH48	Ext : 6202
	Rosnizam Bin Kamis (Welfare & Discipline Officer) DH44	Ext : 6203
	Mohd Awaluddin Bin Mohamed Bashir (Recruitment and Data Officer) DH41	Ext :1040
	Zulina Binti Yusoff (Walfare Officer) DH41	Ext : 6204
	Nurul Hayati Binti Muda (Administration Assistant Clark) N17	Ext : 6206
	Norfahani Binti Abd Rahim (Administration Assistant Clark) N17	Ext : 6207
	Firdaus Bin Iderus (General Administration Assistant Officer) N1	Ext: 1049

8.2 EXAMINATION UNIT

Function	Contact Personnel	Contact No
Every Polytechnic under the Ministry of Educationis responsible for providing guidance on learning, assessment, control and conduct of the examination. Conferment of Certificate and Diploma to each student is subject to approval and confirmation of Board of Examination and Certificate / Diploma Polytechnic after students have passed all examinations and meet all the requirements of the course. Polytechnic Examination Unit is the unit where responsible for planning, managing and implementing all activities related to student assessment based on the guidelines and evaluationset.	**Azman Bin Mat Hussin** DH44 (Head Of Unit) Examinations Officer	Ext : 6388
	Izan Shuhada Binti Idris DH41 Examinations Officer (Records &Certification)	Ext : 1030
	Mohd Khairudin Bin Saidina Omar DH42 Examinations Officer (Management & Assessment)	Ext : 1037
	Norman Bin Ahmad N11 Assistant Operation	Ext : 6386
	Nafisah Binti Abdullah DH44 Head Coordinator JKE	Ext : 1031
	Hashimi Bin Lazim DH44 Head Coordinator JKM	Ext : 1036
	Nur Hidayah Binti Hassan DH44 Head Coordinator JPH	Ext : 1034
	Nurul Izzati Binti Mohd Noh DH44 Head Coordinator JP	Ext : 1035
	Norul Huda Binti Abdul Razak DH44 Head Coordinator JTMK	Ext : 1011
	Ahmad Fakhruddin Bin Kamaruddin DH41 Head Coordinator JRKV	Ext : 1031
	Nazera Binti Dan DH44 Head Coordinator JMSK	Ext : 1032
	Siti Nurfirdaus Bt Mohd Nasir DH41 Head Coordinator JPA	Ext : 1657

8.3 SPORTS UNIT

Function	Contact Personnel	Contact No
The involvement in co-curriculum creates opportunities for students to develop their talents and interests. To achieve these require commitment, innovation and creativity from both educators and students. It also includes outdoor activities such as sports, uniform units, clubs and societies. The activities should consist of elements that support the physical, emotional, spiritual and intellectual aspects in line with the National Philosophy of Education. The Sports Unit is responsible for: a. managing sports activities inside and outside PTSS compound b. planning and ensuring sports activities are carried out accordingly c. monitoring and keeping record of PTSS athletes d. managing and maintaining the sports facilities e. developing individuality in spiritual, physical and intellectual	**En. Bustamam Bin Bonari** DH48 Head of Department	Ext : 1988
	En. Johanis Bin Mohd Jamil DH44 Head of Cocurriculum	Ext : 1989
	Tn. Syed Azmir Bin Syed Ahmad DH44 Head of Sports Unit	Ext : 6272
	En. Ahmad Zamri Bin Abdul Wahid DH44 Officer of Cultural and Heritage Unit	Ext : 6275 / 1988
	En. Nik Mohd Sofri Bin Nik Abdul Hamid DH41 Cocurriculum - Clubs and Societies	Ext : 6340
	En. Shamsul Anuar Bin Abd Aziz DH44 Cocurriculum – Sports	Ext : 6344
	En. Mohd Zubir Bin Yahaya DH44 Cocurriculum – Uniforms	Ext : 6344
	En. Amirul Affendi Bin Adnan S41 Youths and Sports Officer	
	Pn. Nurul Asmad Bt. Che Harun S41 Youths and Sports Officer	
	En. Saiful Bin Ishak N11 General Office Assistant	

8.4 LIBRARY UNIT

Function	Contact Personnel	Contact No
The library provides quality and up-to-date information to everyone in terms of managing and providing access to information resources. Taking the role as a centre of knowledge, the library acts as a catalyst and assists in the teaching and learning and research in the process of producing creative and innovative semi professional. The Library Unit is also an instrument in inculcating the reading culture among PTSS and the local communities through an ongoing reading campaign. Among the many objectives of the library unit are: a. to acquire relevant and current information for reference b. to manage a collection of information using a standard system for easy access. c. to provide quality information service and cultivate interest in reading d. to support the organization's objectives in teaching, learning and research.	**Ismail Bin Harun** S44 Librarian **Shahrifatulzzainiyah Bt AbdRahman** S32 Assistant Librarian **Nur Salizah Ng Abdullah** S19 Library Assistant **Nur Dalila Bt Azahari** S19 Library Assistant **Nor Hafiza Bt Zakaria** S19 Library Assistant **Zafilah Bt Ismail** S19 Library Assistant **Mohd. Rizal Bin Md. Zahid** C19 Library Assistant **Circulation Counter**	Ext : 6377 Ext : 6378 Ext : 1672 Ext : 1672 Ext : 1672 Ext : 1672 Ext : 1672 Ext : 1673

8.5 LIAISON & INDUSTRIAL TRAINING UNIT

Function	Contact Personnel	Contact No
The Liaison & Industrial Training Unit (UPLI) is responsible for managing students' industrial training affairs. Students will be assigned to a particular organization during their training period based on their respective fields of study. The placement process is finalised before training commences. Students are constantly advised to maintain a high level of discipline. They should abide by the rules and regulations of both the polytechnic and organization. Organizations are advised to consult the polytechnic immediately if there are any disciplinary problems. The objectives of this programme can be summarized as follows: a. to foster a positive character and traits among students b. to develop better communication skills c. to practise good work ethics and conform to rules and regulations d. to expose students to the working environment e. to produce daily report on the training	**Mazrul Hisyam Bin Mat Ali** DH44 (Head of Unit) Liaison & Industrial Training Officer **Mohd Zulfabli Bin Hasan** DH41 Liaison & Industrial Training Officer (Training) **Noor Farhani Binti Mohd Alui** DH41 Liaison & Industrial Training Officer (Liaison) **Marsyita Binti Kassim** N19 Assistant Administrator **Norazlina Binti Abd. Muttoleb** DH44 Head Coordinator JKE **Mohd Fadhli Bin Ahmad** DH44 Head Coordinator JKM **Saiful Bin Mohamed Shuib** DH41 Head Coordinator JPH **Mohd Fardelie Bin Ramli** DH29 Head Coordinator KHK **Mohd Shamsul Bin Ismail** DH44 Head Coordinator JP **Siti Nurdiana Binti Abu Bakar** DH41 Head Coordinator JTMK **Juniza Binti Zamri** DH44 Head Coordinator JRKV	Ext : 6244 Ext :1021 Ext :1020 Ext : 6243 Ext : 1808 Ext : 6284 Ext : 6261 Ext : 6264 Ext : 6521 Ext : 6295 Ext : 6365

8.6 RESIDENTIAL COLLEGE

The uniquely modern PTSS hostel can easily accommodate a total of 3600 students. Students in semester one have the opportunity to enjoy the facilities provided on campus in addition to a comfortable and conducive living environment. Students are placed in the hostel to instill good learning habit, moral values, integration and friendship among students of different race, religion and culture.

<table>
<tr><th colspan="2">Contact Personnel</th></tr>
<tr><td>Principle of Residential College
Pn Nazimah Binti Saad
Tel : 04-9886200, Ext :6355</td><td>Supervisor of Residential College
Pn Saodah Binti Abdullah
Tel : 04-9886200, Ext : 6354</td></tr>
<tr><th colspan="2">Medical Assistant</th></tr>
<tr><td colspan="2">Muhammad Fauzee Bin Asuar</td></tr>
<tr><th colspan="2">Wardens</th></tr>
<tr><td colspan="2">Mohd Zubir Bin Yahaya — Chief Warden
Johanis Bin Mohd Jamil — Deputy Chief Warden
Nur Adlina Binti Hj. Mohd — Deputy Chief Warden</td></tr>
<tr><td>En. Abu Hanifah Bin Mohd Said
En Azran Bin Abdul Razak
En Borhannudin Bin Ya
En Fazly Shahril Bin Norizan
En King Diaw a/l Eh Sut
En Mohd Awaludin Bin Mohamed Bashir
En Mohd Fadzil Bin Allias
En Mohd Fardelie Bin Ramli
En Mohd Firdaus Bin Che Radzi
En Mohd Nurul Akmal Bin Mat Ariff
En Mohd Safirol Bin Md Yusof
En Mohd Shabri Bin Hassan
En Norazrizal Bin Norazmi
En Shamsul Anuar Bin Abd. Aziz
En. Mohd Azha Bin Ismail
En. Mohd Kamarul Ariffin Bin Mohamad Azmi
En. Mohd Ridzuan Bin Abdul Rahman
En. Mohd Rizal Bin Hussain
En. Saiful Bin Mohamed Shuib
En. Zulkifli Bin Sulaiman</td><td>Cik Mime Azrina Binti Jaafar
Cik Zainab Binti Abdullah
Pn. Balqis Binti Ahmad Shahar
Pn. Ku Shazwani Binti Ku Azizan
Pn. Mahirah Binti Rafie
Pn. Nor Arinah Binti Mohamed Zemudin
Pn. Nurishah Binti Wahab@Abdul Wahab
Pn. Rafidah Binti Jaafar
Pn. Rosmini Binti Abdul Rahman
Pn. Rozalita Binti Saupi
Pn. Salasiah Binti Noordin
Pn. Siti Aishah Binti Kadir</td></tr>
</table>

8.7 PSYCHOLOGY AND CAREER UNIT

Function	Contact Personnel	Contact No
The Psychology and Career Unit works on implementing the Human Capital Development program based on psychological approaches which include aspects of development, prevention, rehabilitation and intervention. In addition, this unit also provides counseling and professional guidance to ensure semi professional work force is well balanced mentally and physically. The Psychology and Career unit is responsible for: a. raising self awareness and surroundings b. highlighting ones' potential c. developing multi skills d. promoting studies opportunities **e.** promoting career opportunities	**Wan Kamariah Binti Wan Mat** S41 (Head of Unit) Psychology and Career Officer **Norzila Binti Mhd Noor** S41 Psychology and Career Officer **Raja Rabiatum Adawiyah Bt Raja Mamat** S41 Psychology and Career Officer	Ext : 6208 Ext : 6205 Ext : 1100

8.8 UNIT FOR INSTRUCTIONAL DEVELOPMENT AND MULTIMEDIA

Function	Contact Personnel	Contact No
The Unit for Instructional Development and Multimedia (UIDM) is one of the support unit for Academic and Administration in PTSS. The main functions are: a. Advising and guiding in Instructional Development for the purpose of Learning and Teaching. b. Provide sufficient skill and Audio Visual equipment for any activities (on campus/outside of campus) based on frequent application. c. Supervise in-term of skill and facilities/equipment for any activities by students/lecturers. d. UIDM as Audio Visual Committee for any major events on campus such as Convocation, Students Registration Day, major celebrations and assembly. e. Documentation Record any events on/off campus through video and photo for the purpose of archives.	**Mohamad Naaim Bin Md Zain** DH41 (Head of Unit) Multimedia & Resource Officer **Mohammad Shahiran Bin Salim** DH41 Multimedia & Resource Officer **Ahmad Norhaizam Bin Ahmad Rosli** B19 Photographer **Muhamad Fadzwan Bin Amir Roslan** B19 Designer **Syed Shafirul Bin Wan Idrus** B19 Designer **Shukri Bin Abdullah** JA29 Assistant Engineer	Ext : 6380 Ext : 6380 Ext : 1693 Ext : 1690 Ext : 1690 Ext : 1693

Function	Contact Personnel	Contact No
f. As committee for Design & Printing for most of the major events on campus.	**Oszamry Bin Othman@Ismail** N11 Assistant Operation	Ext : 1693

8.9 INFORMATION TECHNOLOGY & COMMUNICATION UNIT

The Information & Communication Technology Unit (UTMK) is one of the support unit for Academic and Administration in PTSS. The main function of UTMK is: a. Monitor and maintain ICT equipment and campus local network. b. Coordinate the acquisition of hardware, software and computer networks to meet the set standards and avoid duplication in procurement. c. Supervise the movement of ICT equipment. d. Acting as the system administrator for application system such as SPMP, HRMIS and etc.	**Saifulazmi Bin Tayib** F44 (Head of Unit) Information Technology Officer	Ext: 6345
	Nor Hafizah Binti Khadzir F41 Information Technology Officer	Ext: 6346
	Suria Binti Shaari F41 Information Technology Officer	Ext: 6349
	Safariza Binti Md Fazil F29 Assistant Information Technology Officer	Ext: 6347
	Marina Binti Meor Lizi F29 Assistant Information Technology Officer	Ext: 1502
	Sasnidar Binti Yusri F29 Assistant Information Technology Officer	Ext: 1501
	Mohamad Razali Bin Mohamad Ismail FT22 Assistant Information Technology Officer	Ext: 1504
	Muhamad Kamalhamdy Bin Kamaludin FT29 Assistant Information Technology Officer	Ext: 1507
	Mohamad Khairul Fazmi Bin Jamaludin FT19 Assistant Information Technology Officer	Ext: 1503

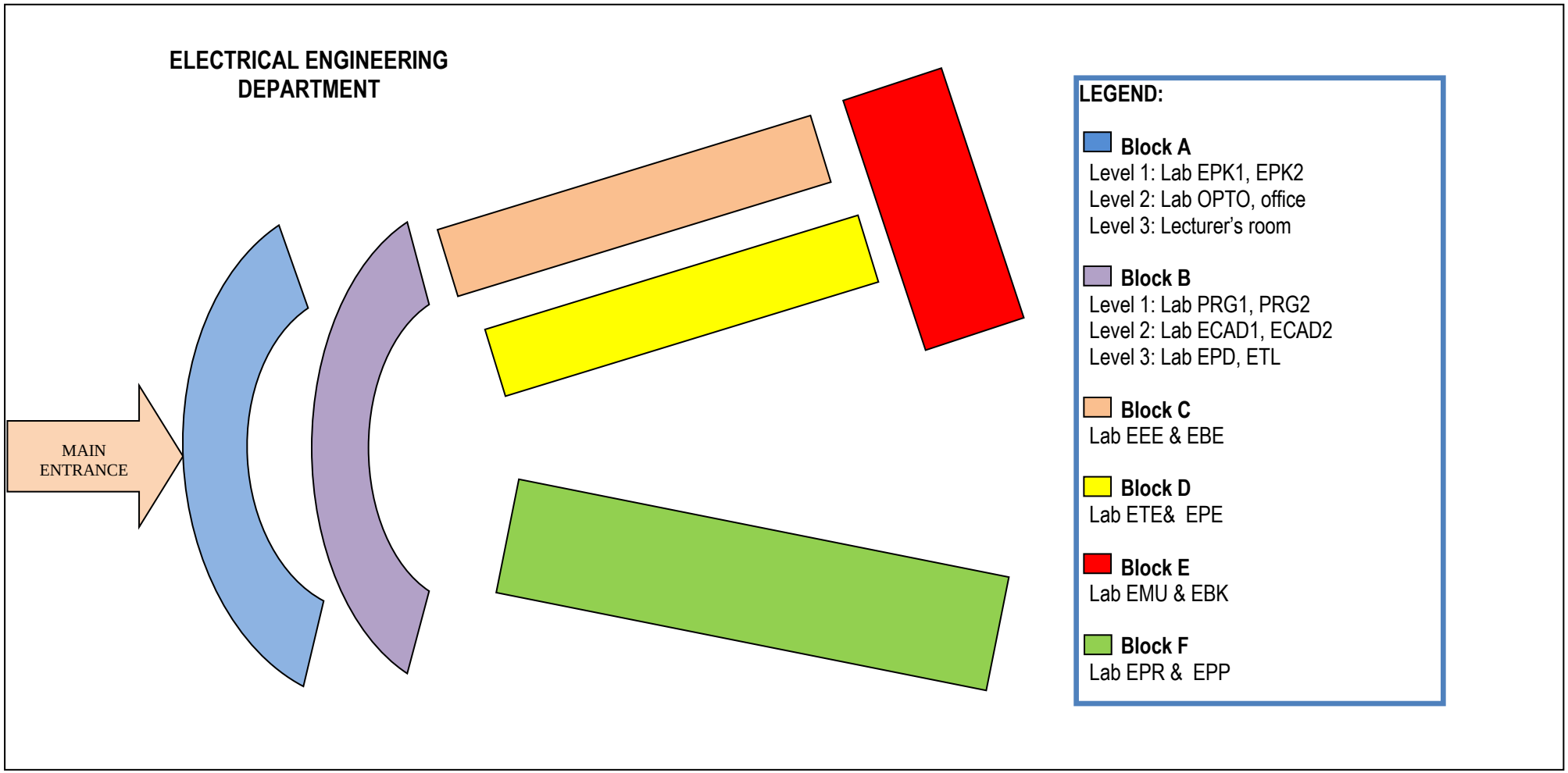
Function	Contact Personnel	Contact No
	Nurul Fara Binti Noor Azman Raman FT19 Assistant Information Technology Officer	Ext: 1508
	Ridzuan Bin Yaakob FT29 Assistant Information Technology Officer	Ext: 1508
	Zuraidah Binti Ghazali FT29 Assistant Information Technology Officer	Ext: 6348
	Mohd Rifaiz bin Mohd Razali FT19 Computer Technician	Ext: 6348

9.0 PROFESSIONAL / SKILLS CERTIFICATION

This profesional certificate is a finishing programme offered to the selected students to give them an added value for the programme.

Professional Certificate	Related Course Code & Course	Descriptions
Green Card (CIDB)	DUW1012 Occupational Safety And Health	- This programme is offered to all Engineering Students before Industrial Training. - To improve and expose students with safety and health awareness in industrial training. - To ensure that students have a basic knowledge about the safety and health in working environment.
	DUT40110 Industrial Training	
AutoDesk Certification - AUTOCAD 2D DAN 3D Essential Skills Development Training	DEE3061 Computer Aided Design	- This programme is specifically offered to Final Year Students in Diploma of Electronic Enggineering (Computer). - To enhance student's skills and technique in 2D and 3D product designs.
Certified Ericsson Training	DEP3273 Communication System Fundamentals	- This programme is specifically offered toFinal Year Studentsof Diploma in Electronic Engineering (Communication). - To expose student to various aspect of telecommunications technology development, network in telecommunications (wireline and mobile) and internet protocol.
	DEP3283 Telephony	
	DEP6323 Wireless Communication	
	DEP5293 Data Communication	
Resume Writing Course- (Unit Kaunseling)	DUT40110 Industrial Training	- This programme is specifically offered to Final Year Students in Engineering. - To strengthen the generic skills of the students as to enable them to be competitive and enhance their career opportunities in the job market. - To strengthen the students human capital potential as part of their skillsto increase employment and technical expertise among graduates.
Teknik menghadiri temuduga (Unit Kaunseling)		
Career Clinic Program - Persediaan ke alam pekerjaan (Pensyarah Pelawat Industri)		- This programme is specifically offered to Final Year Students. - To involving information routing activity direct career to student. - To give exercised as platform to graduate and potential graduate to build career through various employability programme.
Career Clinic Program - Profiling Test (Unit Kaunselinng)		- This programme is specifically offered to 1st Year Students (Semester 1 or Semester 2). - To identify student tendency on career that liked according to personality suitability respectively.

10.0 ELECTRICAL ENGINEERING DEPARTMENT SITE MAP



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