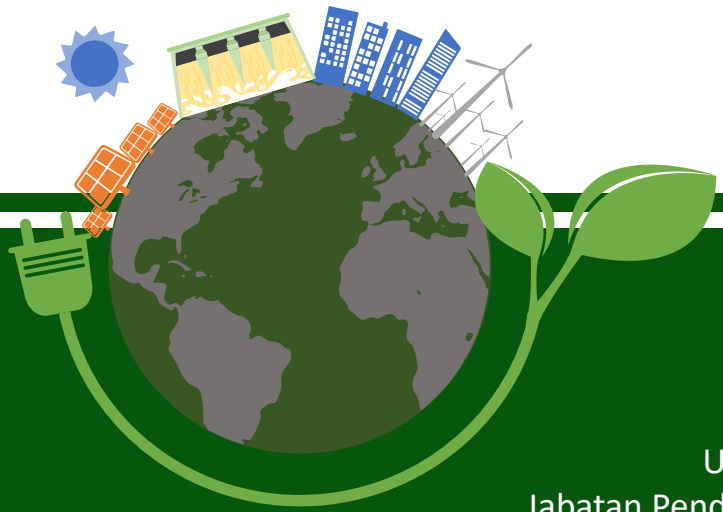
POLITEKNIK MALAYSIA

KEMENTERIAN PENGAJIAN TINGGI

KOLEJ KOMUNITI MALAYSIA

GLOSARI HIJAU

PROGRAM KEJURUTERAAN TEKNOLOGI ELEKTRIK DAN ELEKTRONIK



Unit Kejuruteraan Elektrik
Jabatan Pendidikan Politeknik dan Kolej Komuniti
Kementerian Pendidikan Tinggi

Cetakan pertama, 2021

Diterbitkan di Malaysia oleh
Jabatan Pendidikan Politeknik dan Kolej Komuniti
Persiaran Perdana Presint 4
62100 WP Putrajaya

Perpustakaan Malaysia
Data-Pengkatalogan-dalam Penerbitan
e ISBN 978-967-19041-3-8

9 7 8 9 6 7 1 9 0 4 1 3 8

DOKUMEN INI TERPAKAI BAGI KURIKULUM
SELEPAS TAHUN 2019
PROGRAM KEJURUTERAAN
TEKNOLOGI ELEKTRIK & ELEKTRONIK

Jawatankuasa Pembangunan **Glosari Hijau**

Program Kejuruteraan Teknologi Elektrik Dan Elektronik

Penaung

Ts Noor Aidi Binti Nadzri

Penasihat

Suzanah Binti Hashim

Penulis dan Penyunting

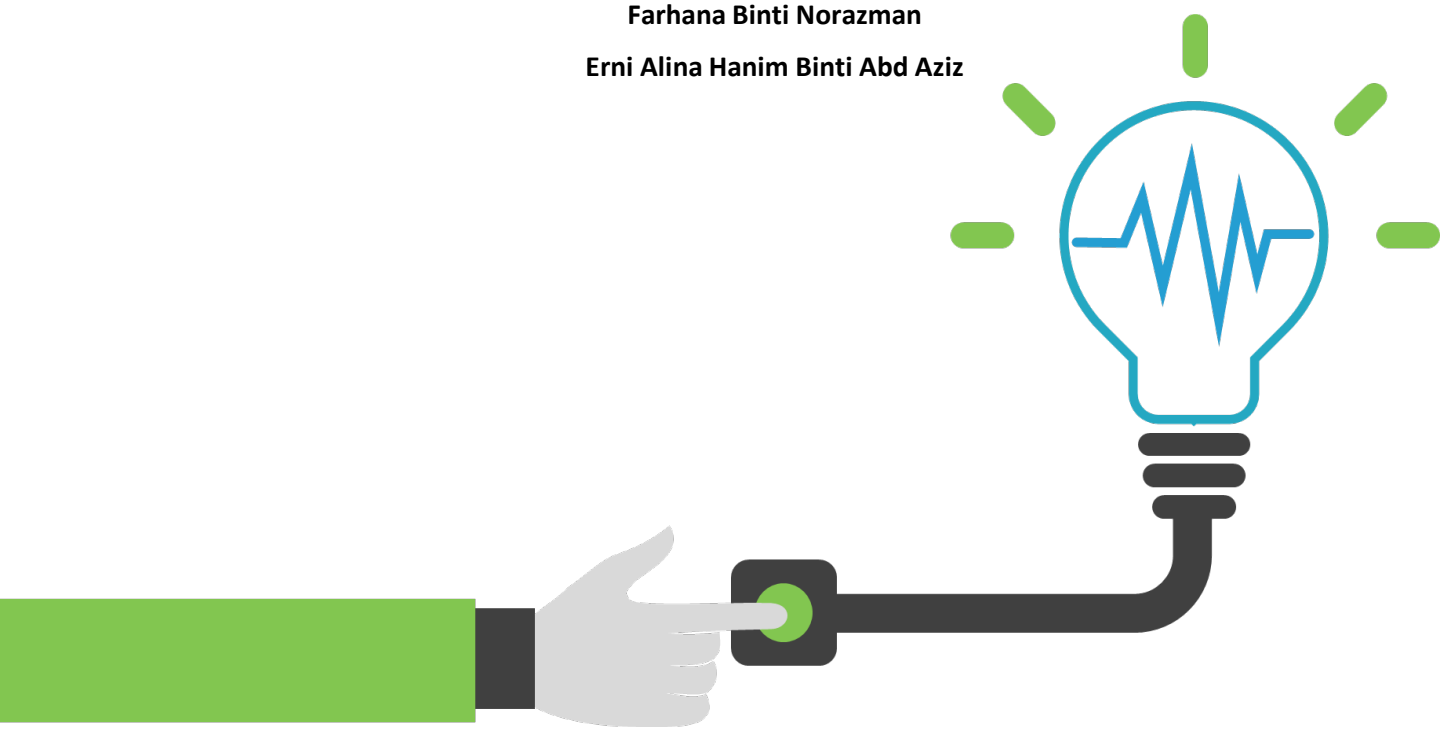
Ilmi Bin Mohd Ariffin

Suziyana Binti Yaacob

Norzilahwati Binti Md Nor

Farhana Binti Norazman

Erni Alina Hanim Binti Abd Aziz



Jawatankuasa Pembangunan **Glosari Hijau**

Program Kejuruteraan Teknologi Elektrik Dan Elektronik

AJK Pembangunan Kurikulum **Glosari Hijau**

Noor Hayati Binti Hamzah

Shokhana Binti Haimin

Razimah Binti Abd Rahim

Norlie Yuzzana Binti Ibrahim

Zamri Bin Zakaria

Ida Maria Binti Mohd Yusoff

Zakiah Binti Md Saad

Nurul Huda Binti Mohamad Salleh

Syahrunizam Bin Buyamin

Helmi Bin Jamaludin

Fatimah Rusbiahty Binti Ahmad

Shaffie Bin Husin

Hjh Juhaida Binti Zakaria

AJK Semakan **Glosari Hijau**

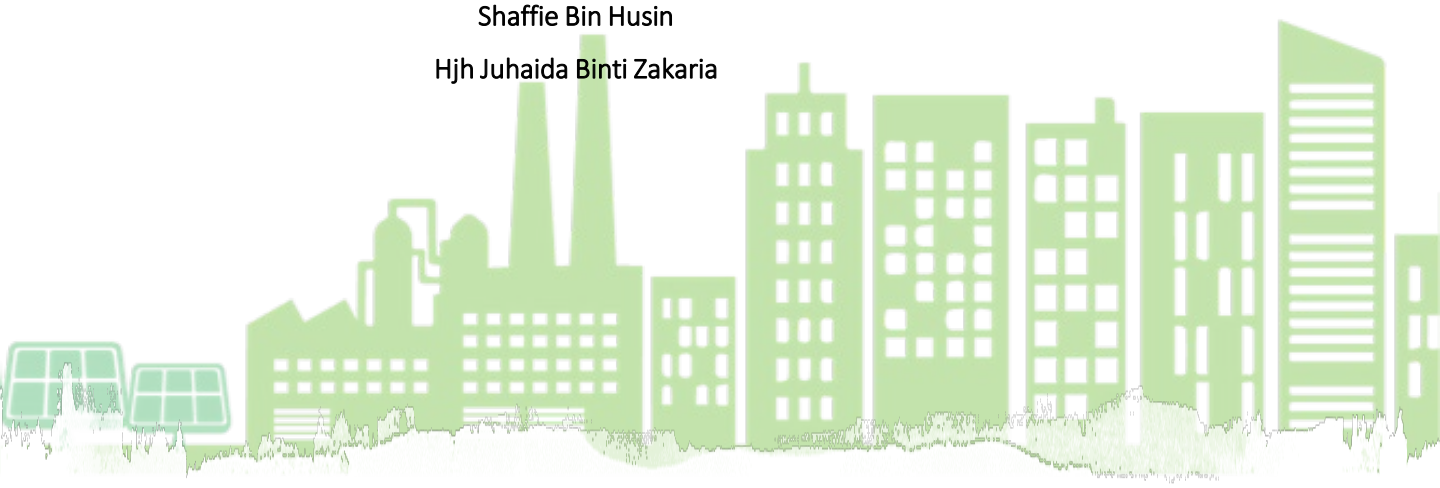
Zainal Anuar Bin Bakri

Helmi Bin Jamaludin

Fauzi Bin Ghani

Mohd Yusri Bin Abdul Rahim

Norhayati Binti Affandi



PRAKATA

Assalamualaikum dan Salam Sejahtera,

Syukur ke hadrat Allah S.W.T kerana dengan rahmatNya, Unit kejuruteraan Elektrik, Bahagian Kurikulum, Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK) berjaya menyempurnakan buku Glosari Hijau Program Kejuruteraan Teknologi Elektrik & Elektronik cetakan pertama.

Pembangunan buku ini bertujuan bagi membuktikan kandungan silibus kurikulum Program Kejuruteraan Teknologi Elektrik & Elektronik mempunyai dan mengamalkan elemen teknologi hijau serta kelestarian tenaga mampan. Selaras dengan objektif buku *Blueprint POLYGreen*, aspek pembangunan dan pengurusan amalan hijau perlu sejajar dengan pengurusan strategik politeknik serta pemantapan dan penambahbaikan halatuju pengurusan strategik politeknik ke arah pengiktirafan politeknik mampan.

Melalui kerjasama bersama Pengerusi Program, Ketua Penggubal dan Penggubal setiap program, pengumpulan elemen - elemen hijau dan kelestarian tenaga di dalam setiap CLO telah dikumpulkan dan diterbitkan melalui Glosari Hijau Program Kejuruteraan Teknologi Elektrik & Elektronik cetakan pertama. Buku Glosari Hijau ini juga adalah terpakai bagi kurikulum selepas tahun 2019 bagi Program Kejuruteraan Teknologi Elektrik Dan Elekrtonik.

Unit Kejuruteraan Elektrik
Bahagian Kurikulum
Jabatan Pendidikan Politeknik dan Kolej Komuniti
Tahun 2021

Assembly Language

Assembly Language is a low-level programming language. It helps in understanding the programming language to machine code. It mainly helps in speed optimization that increases efficiency and performance.

Automation

Automation is the use of equipment or devices, esp. computers, in any system or process to improve its efficiency or effectiveness and reliability. Automation involves a very broad range of technologies including robotics and expert systems, telemetry and communications, electro-optics, cybersecurity, process measurement and control, sensors, wireless applications, systems integration, test measurement etc. The benefit of automation includes labor savings, reducing waste, savings in electricity costs, savings in material costs, and improvements to quality, accuracy, and precision.

Behaviours

Human decisions and actions that directly or indirectly affect mitigation or the potential impact of climate change. Behavior refers to human decisions and actions (and their perceptions and judgments) that directly or indirectly influence mitigation or the potential impact of climate change (adaptation). Human decisions and actions are relevant at different levels, from international, national and sub-national actors, to NGOs, tribes or high-level decision makers, to communities, households, and individuals and consumers.

Bioenergy

Useful, renewable energy produced from organic matter, which may either be used directly as a fuel or processed into liquids and gases.

Biofuel

Liquid fuels typically derived from harvested plant material, used primarily for transportation. These are different from fossil fuels, which are derived from transformed organic material residing in the Earth's crust for millions of years.

Biogas

A medium of gas containing methane and carbon dioxide, resulting from the action of microorganisms on organic materials such as a landfill.

Biomass

A renewable energy source consisting of non-fossil biological material. This includes wood and wood by products, municipal waste, methane from landfills, and fuel from agricultural crops.

Biomedical Instrumentation

Biomedical instrumentation in engineering technology includes the manufacture, installation, calibration and repair of the machines used in healthcare facilities and with many types of medical equipment, including imaging technology and laboratory equipment. Green Instruments will keep perfecting and improving existing technologies as well as developing new technologies in order to provide with the best solutions, products, and operate in a safer, more efficient, and environmentally friendly way.

C Language

A general-purpose, procedural computer programming language supporting structured programming, lexical variable scope, and recursion, while a static type system prevents unintended operations.

Communication

Concerned with the sending and receiving of signals especially by means of electrical or electroacoustic devices and electromagnetic waves.

Computer Aided Design

CAD is used to design, develop and optimize products. It is extensively used in the design of tools and equipment required in the manufacturing process as well as in the construction domain. CAD enables design engineers to layout and to develop their work on a computer screen, print and save it for future editing. CAD technique shows high potential to reduce the cycle and cost of product development.

Cost effective

Effective or productive in relation to its cost. Producing good results without costing a lot of money.

Database Management System

Software that handles the storage, retrieval, and updating of data in a computer system.

Diagnosis Technique

Diagnosis technique for equipment faults is widely used in various fields such as aviation, ship, chemical engineering, mechanical equipment and so on. Condition monitoring and fault diagnosis for large-scale

complicated equipment can implement condition-based maintenance, ensure equipment precision, save maintenance costs, prevent accidents and effectively guarantee equipment safety, and simultaneously, can avoid environmental pollution caused by equipment accidents and bring larger economic benefit and better social benefit, owning practical value in engineering.

Diagnostic Procedure

A diagnostic program (also known as a Test Mode) is an automatic computer program sequence that determines the operational status within the software, hardware or any combination there of in a component, a system or a network of systems. It can increase system availability by facilitating the quick revival of fallen systems.

Effectively

Producing a decided, decisive, or desired effect.

Electrical Design

Precise engineering ensures the right amount of electricity to pass through the power to the LED chips to deliver the right amount of light output, color control and to ensure the lifespan of the LED system.

Electrical Grid System

Historically, a network, usually of a power company, for transmitting and distributing electrical power. The modern grid is complex enough to be thought of as an Ultra-Large-Scale system, a network of structures consisting of electric infrastructure, control structure, regulatory structure, industry structure, digital superstructure, convergent networks, and coordination frameworks. Such a system is subject to hidden and overt interactions and cross-couplings, complex constraints, dependencies, and convergences.

Electromagnetic Radiation

The term refers to the emission and transmission of such radiant energy. It is a kind of radiation including visible light, radio waves, gamma rays, and X-rays, in which electric and magnetic fields vary simultaneously along with the equipment. Thus, proper following rules are needed to ensure the safe use of human use and environmental use.

Electromechanical Devices

Electromechanical devices are ones that have both electrical and mechanical processes. The term is usually understood to refer to devices that involve an electrical signal to create mechanical movement, or vice versa mechanical movement to create an electric signal. Often involving electromagnetic principles which can ensure long-endurance, instant energy generation, efficiency, performance, and optimization of the energy.

Electronic Circuit Simulation

Electronic circuit simulation software allows for modelling of circuit operation and is an invaluable analysis tool. It allows the designer to determine the correctness and efficiency of a design before the system is constructed. By mimicking the behavior of the designs, the circuit simulator can provide the designer with information pertaining to the correctness and efficiency of alternate designs. Therefore, the overall cost of building the system diminishes significantly.

Embedded Controller

Embedded Controller is a microcontroller, with input output (I/O) and internal features targeted to suit the typical needs of a low power platform. It provides real time operating system, high performance and flexibility to adapt to changing system needs at lower cost.

Embedded System

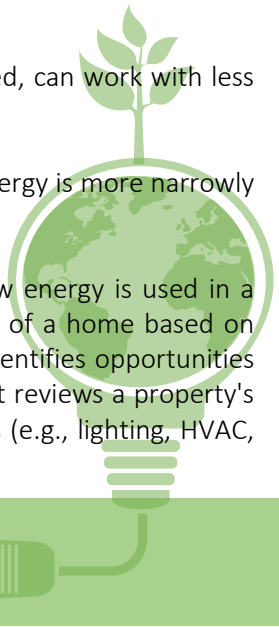
Embedded systems are built to achieve certain efficiency levels. They are small sized, can work with less power and are not too expensive.

Energy

This is broadly defined as the capability of doing work. In the electricity industry, energy is more narrowly defined as electricity supplied over time, normally expressed in kilowatt-hours.

Energy Audit

An energy assessment or energy study to determine where, when, why, and how energy is used in a home, and to identify opportunities to improve efficiency. It includes an evaluation of a home based on data from inspections, diagnostics, data collection, analyses, and reporting, which identifies opportunities for the homeowner to improve energy efficiency. The process wherein an expert reviews a property's current energy usage, conducts an onsite inspection of the property and its systems (e.g., lighting, HVAC, processes.) and makes recommendations for reducing energy usage.



Energy Commission (EC) & MS IEC 60364 standard

MS IEC 60364 : Electrical Installations of Buildings standard by Energy Commission (EC) as a wiring guide for all Wiremen and Electrical Contractors for undertaking electrical wiring in residential buildings to conform to the Electricity Regulations 1994. Safety requirements in electrical wiring works must be met to eliminate accidents causing physical injuries and loss of life or property.

Energy Conservation

Using less energy (kWh) irrespective of whether the benefits increase, decrease or stay the same. Energy conservation is thus the goal if environmental targets are to be met.

Energy Consumption

Quantity of energy consumed within the scope of the management system.

Energy Efficiency

Energy Efficiency means using electricity wisely or less energy in order to accomplish the same tasks whether at home or at the workplace.

Energy Efficiency and Conservation Acts

The Acts that pursuit of achieving national aspirations for effective utilization of energy, electricity and thermal, across all key sectors.

Energy Efficiency Awareness

Awareness of a user or occupant of a building that his/her actions have an impact on the energy performance or demand of a building.

Energy Efficiency Measure

A particular good or practice that provides an energy efficiency benefit. Upgraded insulation, energy efficient appliances, and adjusting a boiler's limit control are examples of measures.

Energy Efficiency Potential

The amount of energy savings possible.

Energy Efficiency Standard

Energy efficiency standards are a set of procedures and regulations that prescribe the energy performance of manufactured products, sometimes prohibiting the sale of products that are less efficient than a minimum level.

Energy Management System

Management system to establish an energy policy, objectives, energy targets, action plans and processes to achieve the objectives and targets. Promotes the energy performance of an organization through the achievement of improvements in energy consumption throughout the operations determined to be within the scope of the management system.

Energy Measures

In climate policy, measures are technologies, processes or practices that contribute to mitigation, for example renewable energy (RE) technologies, waste minimization processes, public transport commuting practices.

Energy Performance

Energy performance is the main indicator of energy management, and the information is related to level of energy consumption effectiveness.

Energy Policies

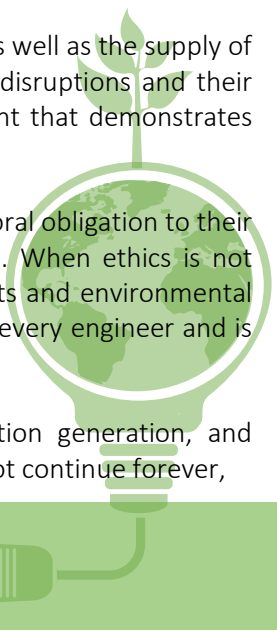
Energy policies are the actions governments take to affect the demand for energy as well as the supply of it. These actions include the ways in which governments cope with energy supply disruptions and their efforts to influence energy consumption and economic growth. An official document that demonstrates support & commitment to improving energy performance.

Engineering Ethics

Engineering Ethics is the set of rules and guidelines that engineers adhere to as a moral obligation to their profession and to the world. Engineering is a professional career that impact lives. When ethics is not followed, disaster often occurs; these disasters not only include huge monetary costs and environmental impacts, but also often result in the loss of human life. Engineering Ethics applies to every engineer and is very important.

Environment Sustainability

Environmental sustainability is the rate of yield of renewable resources, pollution generation, and reduction of non-renewable resources that can be sustained indefinitely. If they cannot continue forever,



then they cannot survive. It is important to focus on environmental technologies and related procedures and materials. Environmental sustainability in engineering focuses on technical procedures and solutions to protect the environment and to improve environmental hazard control measures.

Environmental Effects

The invention, design and application of chemical products and processes to reduce or to eliminate the use and generation of hazardous substances. Perhaps the most urgent issue for green technology, this includes the development of alternative fuels, new means of generating energy and energy efficiency.

Environmental Policy

A statement by an organization of its intentions and principles in relation to its overall environmental performance. Environmental policy provides a framework for action and for the setting of its environmental objectives and target.

Environmental Sustainability

The rates of renewable resource harvest, pollution creation, and non-renewable resource depletion that can be continued indefinitely. If they cannot be continued indefinitely then they are not sustainable.

Environmentally or Eco-Friendly

Environmentally friendly, eco-friendly, and nature friendly refer to goods and services considered to inflict minimal harm on the environment. The terms are not based on any standard and thus have no specific meaning.

Ethical Responsibilities

An ethical code is a listing of principles, values and aspirations based on desired conduct and born in the traditions of the healing professions. Environmental ethics is the philosophical discipline that considers the moral and ethical relationship of human beings to the environment. Human values become a factor when looking at important environmental ethics because they are the things that are to individuals that they then use to evaluate actions or events.

Feed-in Tariff

A 'pricing law' where the rates paid to producers of electricity from renewable sources are set in a law and calculated to provide sufficient profitability for the investment.

Fuel Cells

One or more cells capable of generating an electrical current by converting the chemical energy of a fuel directly into electrical energy. Fuel cells differ from conventional electrical cells in that the active materials such as fuel and oxygen are not contained within the cell but are supplied from outside.

Green Building

A building that utilizes design and construction practices that dramatically improve the efficiency of its use of resources including energy, water, and materials over the complete life cycle of the building, while improving human health and productivity.

Green Certificates

A certificate that represents a unit of renewable electricity generated that can be used to verify the fulfilment of an obligation to source a certain percentage of renewable generation as required in Renewable Portfolio standard schemes. Trading may be allowed so that companies that under-achieve them obligation can buy certificates from those who have over-achieved.

Green Energy Lifelong learning

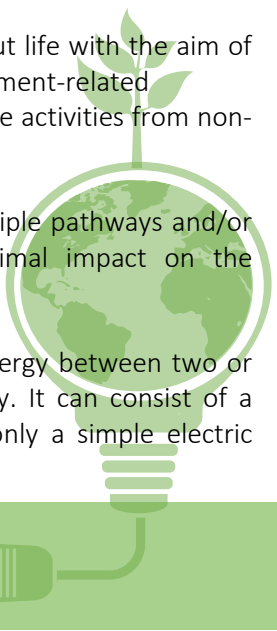
Lifelong learning encompasses all learning in green activities undertaken throughout life with the aim of improving knowledge, skills and competences, within personal, civic, social or employment-related perspectives. The intention or aim to learn is the critical point that distinguishes these activities from non-learning activities, such as cultural or sporting activities.

Green Energy System Integration

Process of coordinating the operation and planning of energy systems across multiple pathways and/or geographical scales to deliver reliable, cost-effective energy services with minimal impact on the environment from natural sources.

Green Energy System Interconnection

The physical plant and equipment required to facilitate the transfer of electric energy between two or more entities from the power generation included sources from renewable energy. It can consist of a substation and an associated transmission line and communications facilities or only a simple electric power feeder.



High Level Programming Language (HLL)

A programming language such as C, FORTRAN, or Pascal that enables a programmer to write programs that are independent of a particular type of computer. Less error prone, easy to find and debug errors.

IEEE

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. IEEE and its members inspire a global community through its highly cited publications, conferences, technology standards, and professional and educational activities also in greening technologies.

Image Processing

The analysis and manipulation of a digitized image, especially in order to improve its quality.

Innovative Vision

Attention to environmental sustainability represents an essential issue in order to integrate environment into their strategies, are producing specific innovations that have also positive environmental outcomes. Implementing green innovations represents a great challenge for the acquisition of new resources and competences that differ significantly from their existing competences. Innovative vision will focus for eco-friendly makeovers, transforming them into state-of-the art green technology inventions.

Input

Input refers to the amount of energy put into a device, and output refers to the amount of energy that comes out. Efficiency is the ratio of useful energy that comes out of a device to the total energy that went into it.

Integrated Circuit

The entire physical size of IC is extremely small than that of discrete circuit. The weight of an IC is very less as compared entire discrete circuits. It's more reliable.

Interface

Generally, the goal of user interface design is to produce a user interface which makes it easy, efficient, and enjoyable (user-friendly) to operate a machine in the way which produces the desired result (i.e., maximum usability).

Intermittent Renewables

Intermittent renewables include solar, wind, ocean wave, tidal and, in some cases, hydroelectric. One important characteristic of intermittent renewable energy generation is that the power output can change rapidly over short periods of time.

Internet of Things

The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data.

Laser Safety

Laser safety is the safe design, use and implementation of lasers to minimize the risk of laser accidents, especially effects can range from mild skin burns to irreversible injury to the skin and eye. To protect against all possible types of laser exposure, the physician and everyone in the room should wear protective laser glasses. The ANSI standards require a baseline eye examination for all laser users and health care practitioners who are exposed to laser energy.

Led Design Technology

In terms of energy efficiency, energy usage, environmental impacts, durability, and light (lumen) output.

Low Power Consumption

Radio transmitters that send out relatively little power; using the minimum power necessary to carry out the desired communications, transceivers typically, automatically reduce the transmitted power to much less than the power required for reliable one-way broadcasts, power required for reliable one-way broadcasts, the power of the broadcast is less, i.e., the radio waves are not intended to travel as far as from typical transmitters ,the consumption of electric power is deliberately low.

Maintaining Electrical Equipment

Properly maintained equipment produces less waste and environmental impact. Safety is dramatically increased when equipment is properly maintained. marketing, pricing, sales and other business functions. The goal is sustainable and profitable revenue growth.

Managerial Values

Value management is a holistic approach that results in alignment between product management,

Green management is the organization wide process of applying innovation to achieve sustainability, waste reduction, social responsibility, and a competitive advantage via Continuous learning and development and by embracing environmental goals and strategies that are fully integrated with the goals and strategies of the organization.

Mechanical Design

The lifespan of LED product last for more than 50,000~100,000 hours, which last for years. The exterior and interior construction of the luminaire, including housing, finish, power chamber, wirings, down to the bolts and screws, must be robust, durable, and a design well thought out to ensure the LED system performs well and to last long. Good mechanical engineering protects the LED system from deterioration, vibration, weather conditions, debris or external factors to ensure its lifespan and less maintenance required.

Medical Imaging Modalities

Medical imaging modalities, for example, includes magnetic resonance imaging (MRI), ultrasound (the safest form of medical imaging) , medical radiation, angiography and computed tomography (CT) scanners. In addition, to several scanning techniques to visualize the human body for diagnostic and treatment purposes. Advanced Medical imaging scanners and protocols keep radiation doses as low as possible while attaining high-quality images.

Medical Imaging Practice

The exercise to eliminate mercury, minimize chemical waste, and reduce the health care sector's total waste volume in a medical imaging profession.

Motor Control

Motor controls are used almost everywhere today. Whether to execute the use of pumps in different applications or to control the movements of machines or conveyor belts. A key point of this motor control is the energy efficiency and the economy, but also the simplicity of implementation is an essential feature of the control of motors. To accomplish these tasks, modern and sophisticated inverter or frequency inverter to control the machines are deployed and used.

Multimedia

The use of a variety of artistic or communicative media. Thus, using images, video and animations alongside a text stimulates the brain. Student attention and retention increase. Under these circumstances, in a multimedia learning environment, students can identify and solve problems more easily compared to the scenario where teaching is made possible only by textbooks.

Multimedia Element

Multimedia technologies provide an important support to entertainment services with a myriad of coding, access and distribution alternatives. Anywhere and anytime communication technologies facilitate entertainment services, while final devices enhance the user experience. It is the simplest, and often the most effective way to get one's message across.

Multiple Access

Multiple access is a communication technique that lets multiple users share the allocated spectrum in the most effective manner, that is multiple users can share the same channel by using designated communication techniques. In computer networks and telecommunications, the multiple access method permits various terminals to access and use the same multi-point transmission medium to transmit over it and share its capacity. This sharing technique enhances spectral efficiency or sustainability of resource as well as energy efficiency due to the use of same link/channel by all users.

Network Protocol

A network protocol defines rules and conventions for communication between network devices. Network protocols include mechanisms for devices to identify and make connections with each other, as well as formatting rules that specify how data is packaged into sent and received messages.

Network Security

Network security is protection of the access to files and directories in a computer network against hacking, misuse and unauthorized changes to the system. An example of network security is an anti virus.

Network Service

An application running at the network application layer and above, that provides data storage, manipulation, presentation, communication or other capability which is often implemented using a client-server or peer-to-peer architecture based on application layer network protocols.

Network simulation

A technique whereby a software program models the behavior of a network by calculating the interaction between the different network entities (routers, switches, nodes, access points, links etc.).

Norm Practice

To be professionally engaged in a principle of right action binding upon the members of a group and serving to guide, control, or regulate proper and acceptable behavior.

Open Source

Denoting software for which the original source code is made freely available and may be redistributed and modified.

Optical Design (Light Source)

Light-emitting diodes or LEDs are a semiconductor light source in optical design. LEDs are used as indicator lights in many devices, but today they are increasingly being used as energy-efficient general lighting. LED light bulbs can now replace the light output of 75–100-watt incandescent bulbs with only 3–13- watt energy consumption.

Optimum Performance

The best accomplishment of a given task measured against preset known standards of accuracy, completeness, cost, and speed.

Output

Power or energy produced or delivered by a machine or system (as for storage or for conversion in kind or in characteristics).

Pneumatic Systems

Pneumatic systems used in industry are commonly powered by compressed air or compressed inert gases. A centrally located and electrically powered compressor powers cylinders, air motors, and other pneumatic devices. A pneumatic system controlled through manual or automatic solenoid valves is selected when it provides a lower cost, more flexible, or safer alternative to electric motors and actuators.

Power Loss

The ratio of the power absorbed by the input circuit of a transducer to the power delivered to a specified load; usually expressed in decibels. Also known as power attenuation.

Professional Ethics

Conduct their personal and professional lives and activities in an ethical manner. Honesty, justice and courtesy form moral philosophy which, associated with a mutual interest among people, constitute the foundation of ethics. Environmental Professionals should recognize such a standard, not in passive observance but as a set of dynamic principles guiding their conduct and way of life. It is their duty to practice them profession according to this Code of Ethics.

Program

A series of coded software instructions to control the operation of a computer or another machine.

Programmable Logic Controller(PLC)

A programmable logic controller (PLC) or programmable controller is an industrial digital computer which has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, or robotic devices, or any activity that requires high reliability control and ease of programming and process fault diagnosis.

Programming

The process of writing computer programs.

Project Management

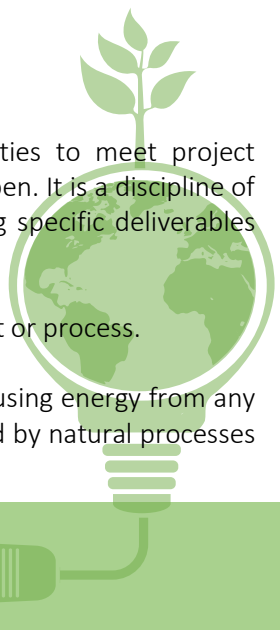
As the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. To sum up, project management is all about making the project happen. It is a discipline of initiating, planning, executing, and managing resources with the goal of completing specific deliverables within budget and time.

Project Prototype

A prototype is an early sample, model, or release of a product built to test a concept or process.

Renewable Energy System

Physically connected generation, transmission, and distribution facilities operating using energy from any form of energy from solar, wind, geophysical, or biological sources that is replenished by natural processes at the equals or exceeds rate of use.



Responsibility

The state or fact of having a duty to deal with something or of having control over someone.

Safety and Health

The field of public health that studies trends in illnesses and injuries in the worker population and proposes and implements strategies and regulations to prevent them.

Safety Consideration

The action of keeping safe or be kept in mind in making a safety decision.

Safety Considerations

Safety engineering aims to manage risk in the workplace by eliminating or reducing it too acceptable level s. As its name implies, safety engineering is about reducing failure, or should failure occur, minimizing it so that the consequences will not be life-threatening. Occupational safety and health fits squarely within the social responsibility component, placing safety professionals at the heart of their employers' sustainability strategy. Safety engineering is the process of designing workplaces to prevent accidents. Engineering Safety Concepts provides detailed approaches and modes for accident reduction by using a risk management process to identify and design out hazards.

Simulation

The imitative representation of the functioning of one system or process by means of the functioning of another.

Social Issues

Social issues are differential access to land and other resources; conflicting demands on the same resources for conservation and economic development of traditional users; marginalization of women; religious or ethnic tensions; winners and losers in privatization and reform programs; structural exclusion of social group; poor governance, adverse social impacts, etc.

Social Safety and Health

Social safety describes the sense of feeling safe with other people. Health has been defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Social Skills

Necessary actions such as promoting basic skills, and green skills so that well-equipped workers can meet the challenges of sustainable development towards Fourth Industrial Revolution in their workplace. It encourages research, planning, design, management and review of activities in a scientifically and technically objective manner. It will incorporate the best principles of the environmental sciences for the mitigation of environmental harm and enhancement of environmental quality.

Standard Procedure

Set of rules or codes mandating or defining product performance (grades, dimensions, characteristics, test methods, and rules for use). Product, technology or performance standards establish minimum requirements for affected products or technologies. Standards impose reductions in greenhouse gas (GHG) emissions associated with the manufacture or use of the products and/or application of the technology.

Green engineering follows nine guiding principles: Engineer processes and products holistically, use syste m analysis and integrate environmental impact assessment tools. Create engineering solutions beyond current or dominant technologies; improve, innovate, and invent (technologies) to achieve sustainability.

Sustainability

A dynamic process that guarantees the persistence of natural and human systems in an equitable manner.

Sustainability Energy

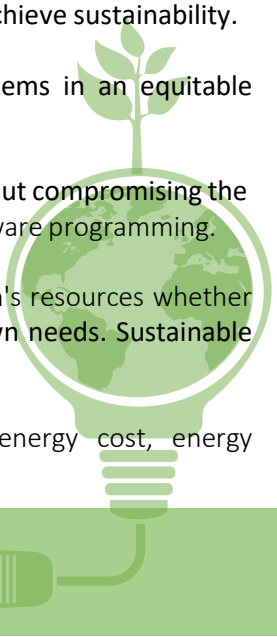
Effectively, the provision of energy such that it meets the needs of the future without compromising the term used in a variety of contexts, including semantics, design, electronics, and software programming.

Renewable Energy

The use of energy from a source that does not result in the depletion of the earth's resources whether this is from a central or local source. Ability of future generations to meet their own needs. Sustainable Energy has two key components; renewable energy and energy efficiency.

Sustainable Awareness

Aware of the issues surrounding energy efficiency such as climate change, energy cost, energy management system etc.



Sustainable Development

That which meets all the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable Resource (Re-use frequency, Microwave, Fiber Optic)

A sustainable resource is a resource that can be continuously replenished, or there is an endless amount of it that can be captured or harnessed and useful towards providing energy without there being a decrease in supply.

Systematically

According to a fixed plan or system; methodically.

Thermal Design

The overall design of a LED system is not perfect if heat is not dissipated. Excess heat reduces the lifetime of both the power supply and the luminaire and causes the LEDs to shift in color. LED performance largely depends on the ambient temperature of the operating environment. Over- driving the LED in high ambient temperatures may result in overheating of the LED package, eventually leading to system failure. Engineering a good thermal design with heat sinks, heat is dissipated away from the fixture, thus improving the LED performance and life of luminaire.

Transducer

A transducer is a device that converts energy from one form to another. Usually, a transducer converts a signal in one form of energy to a signal in another. Transducers are often employed at the boundaries of automation, measurement, and control systems, where electrical signals are converted to and from other physical quantities (energy, force, torque, light, motion, position, etc.). The process of converting one form of energy to another is known as transduction.

Solar Energy

Electromagnetic energy transmitted from the sun (solar radiation). The amount that reaches the earth is equal to one billionth of total solar energy generated, or the equivalent of about 420 trillion kilowatt-hours.

Solar Panels Photovoltaic

Solar panels are a type of photovoltaic (PV) system that collects energy from sunlight and converts it into usable energy for a building. Also called photovoltaic (PV) cells, solar panels typically contain no corrosive chemicals, do not pollute, require little maintenance, and operate silently from the roof of a building.

Specific

Of or denoting a number equal to the ratio of the value of some property of a given substance to the value of the same property of some other substance used as a reference, such as water, or of a vacuum, under equivalent conditions.

Wind Energy

Kinetic energy from air currents arising from uneven heating of the earth's surface. Its convert into mechanical and electric energy.

Wireless

The requirement of massive communication capacity network led to wireless communication systems. Wireless communication is the term used to describe a communication network where no physical wired connection between sender and receiver, but rather the network is connected by radio waves and/or microwaves to maintain communications. In wireless communication, increasing volume of mobile data traffics are possible with sustainability in terms channel resources, monetary costs and ecological footprint. By reducing of physical wired connection between sender and receiver leads to lower negative environmental impacts because the system occupies less land space, less electromagnetic pollution and reduction in cost.

Wisely

In a way that shows experience, knowledge, and good judgement.

Work Ethic and Professionalism

The person places a high value on doing a good job, as well as respecting others and functioning with integrity and professionalism is a component of the concept of work ethic, which describes how a person comes to work and conducts himself on the job which subject to Energy Efficiency and Conservation Acts.

-End-

SENARAI RUJUKAN

1. *Efficiency Valuation Organization (EVO) (September 2010) International performance Measurement a Verification Protocol : Concepts and options for Determining Energy and Water Saving Volume 1.*

2. Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA) (2009) dasar Teknologi Hijau Negara.

3. Kementerian Sumber Asli dan Alam Sekitar Malaysia (2010)

4. BluePrint POLYGREEN, (2015) Jabatan Pengajian Politeknik, Kementerian Pendidikan Malaysia

Unit Kejuruteraan Elektrik
Jabatan Pendidikan Politeknik dan Kolej Komuniti
Kementerian Pendidikan Tinggi

Unit Kejuruteraan Elektrik
Jabatan Pendidikan Politeknik dan Kolej Komuniti
Kementerian Pendidikan Tinggi

e ISBN 978-967-19041-3-8

9 7 8 9 6 7 1 9 0 4 1 3 8