Synopsis for A2M NCP courses: Engineering

Faculty Lecture 1: Renewable and Alternative Energy Technology

The objective of this course is to complement the knowledge relating to renewable and alternative energy technologies include introduction to renewable energy, the types of renewable energy, energy management, energy efficiency, energy policies and systems. Types of renewable energy includes solar energy, biofuels, wind power and hydro energy. Types of alternative energy include nuclear and hydrogen energy, fuel cells. In addition, the introduction of CO2 gas as a feedstock for renewable energy will be introduced.

Faculty Lecture 2: Solar Energy: Photovoltaic and Solar Thermal Systems

The goal of this lecture is to expose students for the knowledge of solar energy and related technologies. Students will be exposed to three interrelated parts, namely, (i) the solar radiation; (ii) the principles and operation of solar cells; and (iii) the type of solar cell efficiency, photovoltaics system and performance. Among the topics of solar energy, include solar radiation, the basic principles of the p-n junction, the operating system of solar cells, other types of solar cells, solar thermal and photovoltaics/thermal (PV/T).

Faculty Lecture 3: Biomass and Bioenergy

Fundamental concepts in understanding biofuels/bioenergy systems; renewable feedstocks, their production, availability and attributes for biofuel/bioenergy production; types of biomass derived fuels and energy; thermochemical conversion of biomass to heat, power and fuel; biochemical conversion of biomass to fuel; environmental aspects of biofuel production; economics and life-cycle analysis of biofuel; value adding of biofuel residues; case studies on biofuel production.

Faculty Lecture 4: Fuel Cell System

This lecture provides a fundamental understanding of fuel cell technology and its application in various sectors that are related to transportation and power generation. This course covers the topics on the basic concept and theory of fuel cell, types of fuel cell, method to characterize and analyze performance of fuel cell as well as fuel cell system engineering process. The latest issues and development of fuel cell technologies, the application and the role of fuel cell technologies in field of renewable energy will also be discussed.

Faculty Lecture 4: Wind and Wave Energy

This lecture introduces renewable technologies, with particular focus on the design of wind-turbines, tidal stream devices and wave devices. The intended learning outcomes are an understanding of wind, wave and tidal stream energy resources and an ability to both assess the design of these three types of renewable energy device and to model the conversion of

environmental flows to mechanical power to inform electrical system design. Additional outcomes are a descriptive understanding of the main engineering components of a marine energy project and an understanding of economic assessment methods.

Faculty Lecture 6: Distributed Power Generation System

This lecture focuses on the new renewable energy based electric energy generation technologies and their integration into the power grid. The principals of new energy based distributed generation technologies: solar, wind, and fuel cells. Interconnection of distributed generation sources to power distribution grid. Economic aspects of distributed generation.

Faculty Lecture 7: Low Energy Architecture

The lecture will start by looking at low energy principals for domestic buildings. A review of the principles for sustainable design of dwellings and non-domestic buildings in different climatic regions. Environmental methods, energy efficiency and requirements for zero carbon homes and buildings. Integration of renewable energies in buildings and governmental incentives, such as the feed-in tariff. Passive solar heating and cooling strategies including shading and natural ventilation.

Faculty Lecture 8: Ambient Energy Harvesting

The lecture deals with introduction of unique ways of the energy generating from surroundings. Currently remote electronics, autonomous low power devices and wireless sensors are powered by batteries. One possibility to overcome energy limitations of batteries or possibly fully substitute batteries is to harvest energy from the environment to power the electronics. The ambient energy is available in the form of radiation, thermal energy and mechanical energy of the environment.

Synopsis for A2M Courses: Architecture

Faculty Lecture 1: Tropical climate - Dr. Wardah Fatimah Mohammad Yusoff

This lecture will cover the topics of tropical climate particularly in Malaysia. Prior to the discussion on the tropical climate characteristics, students will be introduced to the global climate, as well as the factors affecting it in general. Then, focus will be on the tropical climate, where Malaysia is selected as an example. Malaysia, located at a latitude of 2° 30' N and longitude of 112° 30' E, is a good example of tropical climate as it is close to the equator. In understanding the tropical climate, detailed discussion is given on the climate elements such as the air temperature, air humidity, wind, cloud cover and solar radiation. In addition, current scenario and issues related to the tropical climate are also highlighted. Besides that, the lecture will also discuss on the architectural characteristics of the tropical climate, and provide examples of buildings that incorporate these characteristics. Therefore, the students can relate the tropical architectural approach with the climate characteristics where the buildings are located.

Faculty Lecture 2: Thermal comfort - Dr. Wardah Fatimah Mohammad Yusoff

This lecture will cover the topics of thermal comfort in the tropical climate. Discussion will be on the significance of thermal comfort condition, and factors affecting the thermal comfort. Students will also be exposed to the building design that is able to enhance thermal comfort condition in tropical climate. This knowledge is essential in understanding the relation between the surrounding environment and the people's comfort condition

Faculty Lecture 3: Ventilations for buildings - Dr. Mohd. Farid Mohamed

The main objective of this topic is to provide the students with basic knowledge of natural ventilation in buildings. The scope of the discussion would be in the context of hot and humid climate, such as Malaysia. The students are introduced with ventilation categories, the purposes of ventilation, ventilation strategies, factors affecting natural ventilation performance, basic ventilation calculations and application of passive design strategies to enhance natural ventilation in buildings. At the end of this lecture, the students are expected to understand the fundamentals of natural ventilation and able to identify appropriate design solutions for natural ventilation in buildings

Faculty Lecture 4: Daylighting of buildings - Assoc. Prof. Dr. Nik Lukman Nik Ibrahim

This lecture covers the introductory elements of daylighting in buildings. Subtopics include types of daylighting methods, physics of daylight, daylit building typologies, adequate daylight levels, building regulation requirements for daylight and daylighting rule of thumbs for buildings

Faculty Lecture 5: Microarchitecture - Assoc. Prof. Dr. Azimin Samsul Mohd. Tazilan

The purpose of this module to introduce a new approach in redefining and identifying new

microarchitecture (MCR) units in the world and Malaysia. The new redefinition of microarchitecture in today's world will give different views how powerful it can be implemented culturally and the context of new modern urban intervention

Faculty Lecture 6: Design innovation - Assoc. Prof. Dr. Azimin Samsul Mohd. Tazilan
The art of thinking big always associated with creative thinking. Understanding a right structures and process will leads to a successful of creating and developing new products and services in market placements. This is crucial as a product innovation is just a result that born right after the design have come to a great process and series of discipline principles.

Faculty Lecture 7: Design workshop (hands-on) - Assoc. Prof. Dr. Azimin Samsul Mohd. Tazilan
A basic design principles knowledge will be exposed in simplest way to be applied. This to ensure students will understand an earlier theory of design innovation that could take place in a short time project in most creative, fun and fashionably way.

Synopsis for A2M Courses: Social Sciences and Humanities

This course will provide an exposure to students on the importance of identity, culture and communication in the Malaysian multicultural society. Issues related to identity, culture and communication are important in the relationships between multi-ethnic communities in Malaysia as they strenghten the country's nation building process in order to face the challenges of globalization. Identity is considered as a trait which creates similarities and differences amongst individuals. Culture represents an individual's way of life based on traditional, daily and global practices. As for communication, it is a complex and dynamic process of shared meanings which is characterised by specific norms and practices in the social context. In the Malaysian context, border crossings often emerge between individuals to facilitate the individual's socialization and adaptation processes. In addition, border crossing becomes an easy choice to facilitate a two way communication in order to preserve a harmonious relationship between the various ethnic groups in this country. Discussions include introduction to the conceptual framework, identifying interactional challenges in daily lives and surveying border crossing issues from the perspectives of a multi-ethnic groups in this country. At the end of the course, students will be able to understand the concept of identity and identifying similar and different characteristics of identity, culture and the challenges in the lives of the community from various cultures be it at local and global levels together through the development of their intercultural and interactional skills.

Faculty Lecture 1: Introduction to Malay Culture

This lecture introduces students to the Malay Culture of Malaysia. Understanding the history, traditions and practices of the culture and explaining the people and their values.

Faculty Lecture 2: The Malaysian Culture

This lecture introduces students to the concept of diversity and unity in Malaysia. It explains about the cultural and societal structure and focus on the communities in Malaysia, the Malay, Chinese , Indians and the various indigenous groups that makes up Malaysia.

Faculty Lecture 3: Malaysia: Ethos and Ethics

This lecture explains the cultural relations between the various communities of Malaysia and the fundamental values and guiding principles of the diversed communities.

Faculty Lecture 4: Fundamentals of Intercultural Communication

This lecture explains the basic general understanding of the concept of intercultural communication. It discusses about the principles and criteria for succesful interaction between people of diversed cultural and religious backgrounds. Focus will be on Malaysia, Australia and communities within the surrounding geographical areas

Faculty Lecture 5: Cultural Dimensions and Values 1

This lecture focus of Hofstede's model of cultural dimensions and values. It makes a comparison between countries across the globes and the cultural values that they practice.. It is about understanding differences and practices.

Faculty Lecture 6: Cultural Dimensions and Values 11

This lecture is an extension of the earlier lectures by incorporating student presentation and experience on the similiarities and differences of their cultural values. This lecture is also based on the cultural dimensions taxonomy of society.

Faculty Lecture 7: Globalization, Communication and Cultural Identity

This lecture discusses on the issues of migration and adaptation. It looks at the changing global community and how it affects identities of individuals who ar erasides in an intercultural surrounding. It will look at various elements of acculturation, assimilation, culture shock and issues related to identity. There will also be discussions on popular culture experience and the role of media in creating global citizens.

Faculty Lecture 8: Moving Forward: Intercultural Exchange

This lecture discusses on what it takes to be a global citizan and the challenges faced living within a global society. Students are required to share personal experiences and suggest ways to create a more harmonious global society and moving forward towards the concept of one world.