

MKAK 1003 Environmental Management and Sustainability (3 credits)

This course introduces students to issues of environmental management. The course includes discussion on the fundamentals of environmental conservation and control, concept of sustainability, environmental consequences of coastal and inland developments and environmental law and regulations. At the end of the course, students should be able to apply the knowledge by associating environmental problem that arise with poor management of environmental sensitive areas.

MKAK 1053 Solid Waste Management(3 credits)

This course aims to expose students with a comprehensive understanding in solid waste management. It provides the students with an overview of solid waste management, particularly municipal solid waste. The program includes discussion on the practices of municipal waste management, sources of wastes, generation rate and characteristics (physical and chemical properties), analysis of collection systems, handling of waste and disposal practices of municipal waste. Processing and recycling of wastes are also discussed.

MKAK 1063 Water Quality Assessment and Management (3 credits)

This course is designed to expose students to the current trends and various aspects in water quality assessment and management for river catchments, lakes, reservoirs and wetlands. It tackles problems involving water pollution and its impacts on the environment and legislation. Water quality monitoring projects carried out by students will enable application of proper sampling and monitoring methods. At the end of the course students will then be able to assess water quality problems and plan mitigation and control measures for water pollution.

MKAK 1083 Landuse and Environmental Planning (3 credits)

This course covers the fundamental concepts and mechanism underlying land use and environmental planning. It focuses on the understanding of the functions of ecosystems, the impacts of land development activities on such ecosystems, and the appropriate tools/techniques of environmental planning and management that are used to mitigate the impacts.

MKAK 1103 Air and Noise Pollution (3 credits)

This course is designed to expose students with a comprehensive understanding in elements involved in air and noise pollution, and the practical approaches to control the pollution. In air pollution, topics discussed include elements and phenomena of air pollution, meteorology, control of air pollution and design considerations. In noise pollution, topics discussed include elements of noise pollution, effects, types of noise pollution, road traffic & aircraft/industrial noise.

MKAK 1133 Water Pollution Control (3 credits)

This course introduces students to the conventional water and domestic wastewater treatment systems. The content is designed to enable students to understand the processes that are involved in treating water and domestic wastewater. Students will be introduced to characterization of water and wastewater based on basic water quality parameters. This is followed by water treatment processes, which include coagulation, flocculation, sedimentation, filtration and disinfection. Topics on domestic wastewater treatment includes suspended growth processes i.e. activated sludge, oxidation pond, aerated lagoon and biofilm process i.e. biofilter. Students will be given the basic concept of each process and its conceptual design and analysis.

MKAK 1013 Environmental Assessment and Management System (3 credits)

This course is designed to expose the students to environmental and risk assessment. Topics discussed include the requirement of identification of environmental issues, environmental assessment during site investigation, site preparation and construction, project operational and management, and project abandonment. Scope of assessment will include data collection, scope of impact, prediction

of impacts and mitigating measures. The assessment will include social evaluation. The environmental Management Plan (EMP), Environmental Management System (EMS), Environmental Management Compliance Plan (EMCP), Health Risk Assessment (HRA), Engineering Risk Assessment (ERA) and Hazard Operability Study (HAZOP) will be introduced. At the end of the course, the student should be able to assess the environmental quality through environmental assessment and risk assessment. The course enable the student to describe the importance of managing environment through assessment.

MKAK 1043 Environmental Quality and Analysis (3 credits)

Legislation and standards for environmental quality analysis and examination. Principles of biological, chemical and physical methods for environmental quality analysis. Advanced techniques in analytical methods appropriate to environmental quality control. The subject includes laboratory and field works.

MKAK 1073 Sludge Management (3 credits)

This course is designed to expose the students to the management of sludge from industrial and sewerage treatment plant. Topics discussed include the importance of sludge management, quantity and characteristics of sludge and sludge production. The treatment processes involved thickening, stabilization and dewatering. Sludge disposal is introduced to familiarize the student with methods of disposal. At the end of the course, the student should be able to explain the basic concept of sludge management. The course enabled the student to describe the importance of managing industrial and municipal sludge for environmental sustainability.

MKAK 1123 Physico-chemical Treatment Process (3 credits)

This course emphasizes on physico-chemical processes of water and wastewater treatment. The content is tailored to enable students to understand, analyze and apply essential theories and principles in removing various types of contaminant from water and wastewater using physico-chemical processes. Students will be introduced to process fundamentals which include thermodynamic and kinetics of reaction, mass balance concept and reactor analysis. Processes that will be discussed include aeration and air stripping, chemical oxidation, disinfection, chemical precipitation, coagulation, sedimentation, filtration, carbon adsorption, ion exchange and membrane processes. Students will be given the basic concept of each process, its applications, advantages and weaknesses.

MKAK 1143 Environmental Economics (3 credits)

This course explores the fundamental concepts of economic foundations for decision-making pertaining to environmental issues. Designed for students with no formal training in Economics, the modules will overview at introductory graduate level the basic principle of environmental economics, in three main areas of handling environmental resource; economics instruments of environmental policies; and valuation of cost-benefit from environmental changes. Variety of complex environmental engineering problems related to the environmental protection of water, air and soil will be discussed.

MKAK 1153 Environment and Transport Planning (3 credits)

This course analyzes key concepts in the study of transport, energy and the environment, including sustainability. It looks at the importance of transportation-related environmental problems as well as environmental impacts of transport schemes, in the global, national, regional and with particular reference to Malaysia. The course will focus on current transport-related themes confronting many cities in the region, including: rapid motorization and suburbanization and subsequent impacts on transportation infrastructure and quality of life; public sector management and improvement of privately-owned and operated transit systems; and, transportation air pollution problems and potential solutions.

MKAK 1333 Biological Treatment Process (3 credits)

The course is designed to expose students to biological treatment processes in engineered wastewater system. It covers major wastewater engineering aspects such as process analysis and design, treatment technologies, modeling and membrane bioreactor. It will also demonstrate a typical calculation, design and analysis on common biological treatment processes. At the end of the course, students should be able to incorporate and utilize technology in the design of operational unit of wastewater engineering.