

MKAQ 1013 Highway and Infrastructure Design (3 credits)

Road location, network pattern, and geometric design: horizontal and vertical alignments, cross-section curves, crawling lane and weaving area, design of at-grade and grade-separated junctions, roadway in residential areas, cyclist and pedestrian facilities, bus facilities, servicing facilities and parking design.

MKAQ 1023 Road Material and Pavement Evaluation (3 credits)

Properties and test of materials in road construction. Analyze the laboratory testing (Marshall mixture design, Superpave mixture design, and concrete pavement mixture). Recycled aggregate in road construction. Waste materials in road construction. Alternative binders for sustainable asphalt pavement. Nanotechnology and its impact on road construction.

MKAQ 1043 Traffic and Transport Planning (3 credits)

Transport models and four step travel demand forecasting process, land-use demographic survey design and transport planning related data collection, Trips regression and category analysis, growth factor methods, trip distribution models, logit and probit models, route choice models, Appraisal of transportation projects. Economic evaluation and priority ranking techniques, alternative analysis. Citizen participation in transport planning.

MKAQ 1053 Advanced Road Material (3 credits)

Factors influencing thickness design, methods of pavement design: AASHTO, Asphalt Institute, Rigid pavement design, Interlocking block design, surface dressing design, construction of various pavement types, earthworks, cut slopes, embankments, surface drainage, subsurface drainage, erosion control, slope protection, culverts.

MKAQ 1063 Public Transport System (3 credits)

Public transport vehicle characteristics, the planning process of public transport, facilities location analysis and layout design, transit system planning and mode selection, highway design and traffic management for buses. Use of intelligent systems in urban mass transport modes and passengers. Economics of fares structure and economic evaluation of public transport plans.

MKAQ 1083 Traffic Management & Analysis (3 credits)

Basic traffic and transportation data collections, analysis and the fundamental theory of traffic flow, capacity assessment of transportation facilities and the Transportation systems management (TSM) planning processes and strategies. TSM includes Advanced Traffic Management (ATM), Urban Traffic Control System (UTCS), Intelligent Transport and Traffic System (ITS) and Highway Information System.

MKAQ 1033 Transport and Environmental Planning (3 credits)

This is one of the courses which will expose students to the fundamental aspects of environmental planning of transportation system. Major topics include identification of environmental disturbances, traffic noise, techniques of estimation, design standard, air pollution, social impacts, transportation of hazardous and toxic material, transport and sustainability, and environmental evaluation and management.

MKAQ 1073 Airport Planning and Design (3 credits)

Legislation and organization of airway industry. Airport planning and size. Airport capacity, type, size and shape of the airport. Expected air traffic volume and control system. Runway traffic management.

MKAQ 1093 Transport Safety (3 credits)

Introduction and Overview, Transport and traffic hazards and comparison with other hazards. Road safety as a "Global Epidemic", policy and attitudes to transport and traffic safety. Methods for

improving road safety: statistical approaches analysis, accident investigation. Quantitative risk analysis. Geometric design and traffic operational aspects of road safety. Accident costs to the society. Road safety projects- holistic approach.

MKAQ 1103 Disaster Management (3 credits)

Types and causes of disaster formation, Processes and mechanisms of disaster management, Traditional and contemporary approaches of disaster management cycles, Assessment of disasters using vulnerabilities and risk assessment, Needs of special organisation structures that support disaster management. Effects of disasters on natural and built-up environment. Logistical and transportation needs during disasters, road safety auditing for anticipated disasters, sustainable construction and development efforts after disasters

MKAQ 1113 Pavement Management System (3 credits)

Overall picture of world highways as well as Malaysian roads, Network level and project level pavement management system, evaluation of different pavement layers and other infrastructure works, such as drainage etc. They will also acquire functional and structural failures of pavement and corresponding rehabilitation works required including life cycle cost analysis. They will gain knowledge about the source of finance for the most important public asset of roads for their construction and maintenance together with integrated asset management.

MKAQ 1123 GIS for Civil Engineers (3 credits)

This course introduce the concept and advanced application of the Geographic Information System (GIS) theories especially in civil engineering field. This course will emphasize on the overview and the application of GIS in civil engineering, GIS data structure, data manipulation and GIS implementation, information presentation of GIS, GIS case study in civil engineering, GIS prototype project, and future technology of spatial data storage. At the end of the course, students will be able to plan, analyse, and modeling the information for develop advanced GIS application related to civil engineering problems.

MKAJ 1013 Advanced Soil Mechanics (3 credits)

This subject is one of the core subjects offered which provide the knowledge on the application and principles of soil mechanics. It considers the following topics: soil and clay mineralogy, strength behaviour of cohesionless and cohesive soils. Mohr-Coulomb failure criterion, peak stresses, effective stress ratio, residual stress and critical state soil mechanics. Principles of the laboratory measurement. Consolidation theory and pore pressure parameters. Difference between 1-D and 3-D Consolidation theory. Field Settlement. Soil-water characteristic curve for unsaturated soils and its applications.

MKAJ 1053 Software Application in Geotechnical Eng. (3 credits)

This course is designed to expose the students in analyzing geotechnical engineering problem using Plaxis 7.2 and Geo-Studio 2004 Products: SEEP/W, SIGMA/W and SLOPE/W. This course will illustrate what students can do with the modern software tools now available and highlight the important/benefits of numerical modeling. The series of example which taken from the existing literature are employed in this courses, intended to provide the students some example problems that they can use to develop their modeling skills. This course also exposes the knowledge on the usage some of the notation and basic input procedures that are used in the software effectively. At the end of the course, students should be able to utilize this software, improve modeling skills and give some new ideas on how to apply numerical models related to geotechnical engineering problems.

MKAM 1033 Construction Technology (3 credits)

Site inspection, investigation, clearance and preparation. Pile driving and construction methods. Construction production and control, IBS, bridge and high rise construction, other methods of construction.