

<b>Brief course description- Course Plan Development and Updating Procedures\</b> <b>Civil and Infrastructure Engineering</b>	<b>QF09/0409-3.0E</b>
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Faculty	Engineering and Technology	Academic Department	Civil and Infrastructure Engineering	Number of the course plan ( 1 )
Number of courses	19	Date of plan approval	18/12/2023	

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908711	3	Research Methodology (Mandatory)	
This course covers topics such as searching and reviewing the literature, identifying a research problem, research ethics, research questions and objectives, types of research, designing a methodology, methods of data collection and analysis using statistical tools, interpretation of data, and drawing conclusions.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908712	3	Advanced Engineering Management (Mandatory)	
This course presents an overview of engineering integration management. It provides a comprehensive understanding to integrate knowledge areas of engineering management such as scope management, time management, cost management, quality management, human resources management, risk management, procurement management and communication management in all phases of engineering projects and production.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908713	3	Engineering Contract Administration and Arbitration (Mandatory)	
This course provides an overview of different types of contracts for different project delivery methods. Students will be introduced to the contracting procedures, bidding and project awarding procedures, national and international procurement regulations, general contracting clauses, professional ethics, change orders procedures, arbitration and dispute resolution methods, schedule delay analysis, and claim analysis.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908714	3	Advanced Technologies in Engineering Management (Mandatory)	
This course provides students with understanding of new technologies in engineering management practices such as the use of Artificial Intelligence (AI), Machine Learning, Computer Simulation, Visualization Systems, Drones, 3-D Printing, and Building Information Modeling (BIM) technologies. Students will experience hands on use of applications and software of BIM technology in engineering management.			

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Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908715	3	Advanced Engineering Economy (Mandatory)	
The course topics will cover: analysis of capital investments in engineering projects, decision analysis methods, cash flows, revenue requirements, activity-based analysis, multi-attribute decisions, probabilistic analysis and sensitivity/risk analysis, methods of choosing economic alternatives, theory of inflation and how to enter it into economic analysis, and cost-benefit analysis in engineering projects.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908720	3	Special Topics in Engineering Management	
Advanced topics selected from the major areas of Engineering Management to provide the student with latest developments.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908721	3	Total Quality Management (Mandatory for Comprehensive Option)	
This course provides students with understanding on how to apply approaches to maintain quality in engineering projects and production. The course will cover Quality Planning, Quality Assurance and Quality Control in engineering projects and production.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908722	3	Information System Management (Mandatory for Comprehensive Option)	
This course provides understanding of principles of modern information systems and databases used in engineering, their types, development phases, and principles of their design, implementation and application. In addition, the course helps understanding the main phases of data mining, data processing, and decision-making.			

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Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908723	3	Risk Management	
This course introduces students to the principles, processes and techniques of Risk Management. It will focus on risk management planning, risk factors identifying, qualitative and quantitative risk analysis, tools for quantifying risk, risk response planning and monitoring, risk register. The course also prepares students to utilize software for the purposes of risk management.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908724	3	Safety Engineering	
This course provides students with understanding to manage safety in engineering and explains why the safety management is a key part of appropriate project management. This course also provides students with understanding on how safety programs can be coordinated among the many project parties to provide human protection systems, and accident and emergency handling to achieve the overall safety. The course also prepares students to utilize safety codes and software for the purposes of safety management.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908725	3	Sustainable Projects Management	
This course provides understanding of sustainable projects and their methods and techniques. The course will describe the impact of sustainability requirements on the cost and schedule of projects. This course also covers the trends in green building design and construction, the various Building Rating Systems such as Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREEM), and the assessment process, materials, and economical analysis of the rating systems.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908726	3	Operations Research	
This course introduces students to linear and nonlinear programming, integer and goal programming, dynamic programming, transportation problems, assignment problems, queuing theory, decision theory, and implementation of operation research in engineering management and production scheduling.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908727	3	Cost Engineering	
The course provides comprehensive understanding in cost management for engineering projects and production. It covers cost estimate, cost planning, cost control, cash flow management and computer applications.			

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Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908728	3	Traffic and Transportation Management	
This module will teach students to analyze problems and propose outline solutions relating to the management and control of traffic. This often involves making use of new technologies, in particular those related to Intelligent Transport Systems (ITS). The course covers this topic through a series of practical examples, predominantly in the roads sector, highlighting the extent to which various management systems can influence transport efficiency and safety in order to achieve a sustainable transportation system.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908729	3	Water Resources and Environmental Systems Management	
This course examines the scientific aspects of managing water quantity and quality. The course introduce regulations and trends for managing water quantity and quality. Fundamentals of flood and drought management are covered, with attention given to the context of global climate change. Furthermore, This course aims to provide students with the skills and understanding necessary to identify, evaluate and respond to the environmental implications of the engineering projects and processes.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908730	3	Production Planning and Control	
This course provides students with understanding of application of industrial engineering theory and practice to the area of operations management and production planning/control. In addition, it provides subjects of analysis and understanding of forecasting, aggregate planning, operations strategy, capacity planning, supply-chain management, just-in time systems, lean manufacturing, agile manufacturing, materials requirement planning, inventory management, short-term scheduling and sequencing, line balancing and other pertinent topics.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908731	3	Advanced Applied Statistics	
This course includes advanced analytical statistical methods such as hypothesis test, multiple correlation and regression, T and F distributions, analysis of variance, planned comparisons and post hoc comparisons, analysis of covariance, nonparametric techniques, and utilizing of SPSS statistical package.			

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Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908732	3	Computer and Communications Networks Management	
This course provides students an understanding of Computer and Communications Networks Management Systems, Methods of Network Management, Fault Management, Configuration Management, Accounting Management, Performance Management, Security Management, Networks Management Protocols, Programing Management, and Agile computer and Communications networks.			

Course number	Credit hours	Title of the course	Prerequisite-co-requisite
0908733	3	Energy Management and Audit	
This course covers two main areas: energy management and energy audit. For the former, the subject illustrates the intrinsic value and concept of energy management and the implementation considerations and steps involved. For the latter, the emphasis is on energy audit methodology and procedures, and the methods used to evaluate energy performance of buildings and its sub-systems, including the use of energy performance benchmarks and comparison with acceptable practice as well as prevailing codes and regulations. The concept of life cycle cost analysis as a tool to evaluate the economic viability of energy-efficiency improvement or energy conservation measures is also covered.			

Approved by department council	Dr. Hesham Rabayah		Date of approval	23/10/2023
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