

MASTER OF GAS ENGINEERING AND MANAGEMENT

PROGRAMME SPECIFICATIONS

The Master of Gas Engineering and Management is offered on a full time basis. The duration of study for the full-time students is between three (3) semesters to a maximum of six (6) semesters.

The candidate must complete a minimum of 46 credits, and must obtain a final academic grade of at least 3.0 CGPA (Cumulative Grade Point Average). The minimum 46 credits taught course consists of several courses including compulsory courses, a university elective course and a master project. Each course normally carries 3 credits, and the assessment is carried out by examinations and assignments. The master project is to be completed in the final semester and will be assessed by a research proposal seminar, a final project report and an oral examination

General Information

1. Awarding Institution	Universiti Teknologi Malaysia
2. Teaching Institution	Universiti Teknologi Malaysia
3. Program Name	Master of Gas Engineering and Management
4. Final Award	Master of Gas Engineering and Management
5. Program Code	MKPM
6. Professional or Statutory Body of Accreditation	MQA
7. Language of Instruction	English
8. Mode of Study (conventional, distance learning, etc.)	Conventional (Taught Course)
9. Mode of operation (franchise, self-govern, etc.)	Self-governing
10. Study Scheme (Full Time/Part Time)	Full Time

11. Study Duration				Minimum: 1.5 years Maximum: 4 years		
Type of Semester	No. of Semesters				No. of Weeks	
	Full Time		Part Time			
	Min	Max	Min	Max	Full Time	Part Time
Normal	3	6	-	-	14	-
Short	-	-	-	-	-	-

Course Classifications

No	Classification	Credit Hours	Percentage
i.	Compulsory modules (university)	3	6.5 %
ii.	Core/Major/Concentration: <ul style="list-style-type: none"> • Courses/modules • Projects/thesis/dissertation 	27	58.7%
		10	21.7%
iii.	Optional/elective courses/modules	6	13.1%
Total Credit Value		46	100%

Programme Educational Objectives (PEO)

1. Graduates incorporate in-depth engineering techniques and natural gas management principles in project technical and economic analysis of gas production, processing, transportation and utilization projects.
2. Graduates manage conducive working environment and readily pursue different challenging roles in regional and global natural gas operation and management positions through effective team work, leadership and communication skills.
3. Graduates demonstrate ethical responsibilities including social issues, safety and environmental awareness and continuously engage in personal and professional growth.

Programme Learning Outcomes (PLO)

PLO1- Ability to integrate advanced scientific and technical knowledge of gas engineering and related management principles

PLO2- Ability to utilize appropriate methodologies, techniques and tools to produce research work of scholarly quality

PLO3- Propose solutions to gas engineering operational problems, designs and management through systematic planning and critical thinking problem solving skills

PLO4- Ability to demonstrate high ethical standards in professional practice including environmental and social issues.

PLO5- Ability to communicate effectively through written and oral modes

PLO6- Ability to perpetually seek advanced knowledge and technology of gas engineering and management for life long learning

PLO7- Ability to demonstrate team working qualities and working effectively with peers and stakeholders

PLO8- Ability to incorporate knowledge of gas engineering and management in business thinking /entrepreneurship related decision making process

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses in this checklist with minimum B grade. Students must achieve a total of 46 credit hours with a minimum of cumulative B grade or CGPA of 3.0 and passed master research dissertation project and has submitted the approved dissertation to UTM. It is the responsibility of the students to ensure that all courses are taken and passed. Students who do not complete any of the course are not allowed to graduate.

NO	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL AND ENERGY ENGINEERING					
PROGRAMME CORE COURSES (Compulsory)					
1	MKPM 1113	Hydrocarbon Gas Exploration, Production and Processing	3	3	
2	MKPM 1123	Hydrocarbon Gas Transportation and Storage	3	3	
3	MKPM 1133	Natural Gas Supply Engineering and Economic	3	3	
4	MKPM 1143	Hydrocarbon Gas Thermodynamic Properties and Utilization	3	3	

5	MKPM 1213	Risk and Safety Management	3	3	
6	MKPM 1223	Asset Management and Control	3	3	
7	MKPM 1233	Gas Contract Negotiation and Implementation	3	3	
8	MKPM1243	Gas Project Planning, Development and Financing	3	3	
9	MKPM 1414	Graduate Project 1	4	4	
10	MKPM 1426	Graduate Project 2	6	6	
	TOTAL CREDIT OF CORE COURSES (a)		34	34	
PROGRAMME ELECTIVE COURSES (Choose only 2 Courses)					
11	MKPM 1153	LNG Technology	6	6	
12	MKPM 1323	Flow Measurement			
13	MKPM 1353	Fire and Explosion			
	TOTAL CREDIT OF ELECTIVE COURSE (b)		6	6	
UNIVERSITY GENERAL COURSE					
14	U*** **3	University General Course	3	3	
15	UKKP 0013	Research Methodology	3	3	
	TOTAL CREDIT OF UNIVERSITY GENERAL COURSE (c)		6	6	
DISSERTATION					
	TOTAL CREDIT TO GRADUATE (a+b+c)		46	46	

COURSE SYNOPSIS

CORE COURSES

MKPM 1113 - Hydrocarbon Gas Exploration, Production and Processing

This course is intended to expose students to the major stages in the life of an oil or gas field; from exploration, production, and finally to processing and demonstrate the link between the many disciplines involved. The contents of the course cover comprehensive introduction to the upstream and downstream that include basic methods, concepts and current and emerging technologies used and as well as issues related to operations, safety and environment.

MKPM 1123 - Hydrocarbon Gas Transportation and Storage

This subject enables students to acquire and practice the fundamental knowledge of liquefied petroleum gases (LPG), natural gases (NG) and liquefied natural gases (LNG) storage. The course also emphasizes on gas reticulation systems which include service pipe sizing, pipe route, pressure testing and corrosion protection systems. The students are also required to prepare a group technical report and present their project at the end of the course. Students also will be exposed to computer software to enhance their learning quality.

MKPM 1133 – Natural Gas Supply Engineering and Economic

This course enables students to understand the fundamentals of gas supply engineering and its relations to gas supply economic. The contents of the course have been designed to emphasize on the fundamental knowledge of gas supply system, pipeline integrity, pressure regulation and measurement as well as pipeline quality control. The contents of the course also highlight various aspects of gas supply economic of both local and international and interaction of gas supply engineering and gas supply economic in newly-developed and existing market. In addition, the course also reviews some energy policy related issues that will influence the development of gas supply system and gas supply economic.

MKPM 1143 - Hydrocarbon Gas Thermodynamic Properties and Utilization

This course provides students further understanding of knowledge of hydrocarbon gas thermodynamic properties and its relation to other various gas utilization related properties such as combustion, flames etc. The contents of the course have been designed to emphasize more on the advanced knowledge of combustion operation, control, and industrial applications and as well as combustion-related safety aspects. The contents of the course also highlight various hydrocarbon fuels derived energy generating technologies and equipment and its impact on environment. In addition, the course content also focuses on the understanding of gas burner system and burner management system for efficient utilization of hydrocarbon gases.

MKPM 1213 – Risk and Safety Management

This course enables students to appreciate and apply the theoretical and practical aspect of safety, risk management, standards and regulations in gas

industry and employ the techniques of hazard identification and risk assessment in the design, operation and management of gas related facilities.

MKPM 1223 - Asset Management and Control

The Asset and Management and Control course (MKTM 1223) is dealing with the study of system that monitors and maintains things of value to an entity of group. It may apply to both tangible assets such as buildings and to intangible concepts such as intellectual property and goodwill. Throughout the course, strong emphasis is placed on how the practice of managing assets to achieve the greatest return (particularly useful for productive assets such as plant and equipment) and the process of monitoring and maintaining facilities systems with the objective of providing the best possible service to users.

MKPM 1233 - Gas Contract Negotiation and Implementation

This course enables students to understand the concept of gas negotiation to sustain the stable supply of energy since consumers are interested in long term stability, predict the potential policy mistake, gas development risks, strategy for the gas chain and relationship between gas supply and purchase agreement, prepare the draft invoice for gas supply and purchase agreement, legal framework, contract structure, and explain the role of government with regard to the energy supply.

MKPM 1243 - Gas Project Planning, Development and Financing

This course enables students to elaborate confidently on government policy and regulatory framework related to oil and gas industry, set out the principles of planning on development of gas projects, become leader in safe and efficient operation in the oil, gas and petrochemical industry in Malaysia, and prepare an analysis on investment and financing of gas potential projects.

MKPM 1414 - Graduate Project 1

The first part of Graduate Project requires students to prepare the research proposal. This might involve practical activities such as literature review and gantt chart preparation. At the end of the course, students should be able to prepare a proposal compiling the research proposal according to the UTM

thesis-writing format. In addition, students will have opportunity to gain important generic skills such as communication, team working, problem-solving and creative and critical thinking.

MKPM 1426 - Graduate Project 2

This course is continuation of the Graduate Project I (MKTM 1414). The second part of Graduate Project requires students to implement the research proposal that has been prepared in the previous semester. This might involve practical activities such as laboratory works, data collection from industry and computer programming / simulation. At the end of the course, students should be able to prepare a full report compiling the first and second part of the Graduate Project and subsequently present their research findings. Finally, students must submit a bound thesis according to the UTM thesis-writing format. In addition, students will have opportunity to gain important generic skills such as communication, team working, problem-solving and creative and critical thinking.

ELECTIVE COURSES

MKPM 1153 - LNG Technology

This course enables students to forecast of world energy consumption and role of Gas-to-Liquid (GTL) technology, determine the most accepted method to liquefy natural gas and suitable equipment as well as material used under cryogenic conditions, propose and design the storage system as well as identify its accessories, identify the latest technology to enhance the performance of the storage system and carry out inspection to enhance the integrity of the liquefaction plant.

MKPM 1323 - Flow Measurement

This course provides student advance understanding of knowledge of flowmeter technologies and designs have evolved in order to cover the vast number of applications. These range from the flow of blood in small arteries to the flow in rivers and canals, from cryogenic liquids up to high temperature gases. The operating conditions and applications often dictate the choice of

technology. The contents of the course have been designed to emphasize more on the advanced knowledge of fluid flow terminology, flow measuring principles, installation, operation and maintenance, and flow selection. The contents also highlight special applications as well as calibration and verification of the flowmeter. Furthermore, the course content also focuses on the accreditation and international standards involve in the flow measurement operations.

MKPM 1353 - Fire and Explosion

This course enables students to understand the basic concept of fire science and combustion and related calculations as well as to expose them to the concept of explosion and detonation. In addition, the principles of fire and explosion protection and mitigation will be discussed within the context of understanding the fire and explosion development mechanism. At the end of the course, students should be able to explain and relate the fundamental knowledge of combustion, flame and explosion and its important safety aspects involving gaseous fuel utilization. Students should able to apply general combustion and engineering principles to fires and explosion and should know the parameters involved on the initiation of both fire and explosion. The students should be also able to use CFD fire modeling (CFast) to analyze the fire development on the case studies given.

GENERAL COURSES

UKKP 0013 - Research Methodology

This course is designed to deliver some important aspects and skills regarding of research methodology to the postgraduate students. In general, this course will enable the students to identify and apply appropriate research methodology in order to plan, conduct and evaluation this undertaken research. The students will be taught for the approaches to write meaningful problem statement, measurable objectives and systematic scope of study. Students will also be introduced to the techniques and useful resources to conduct an effective literature review. The purposes of planning a proper research designed and the relationships between the research methodology and research design are clearly described to the students. This course also aims to deliver the technique for data collections and analysis. Finally, the students

will be exposed to the skills and techniques required for the preparation of research proposal and thesis, as well as the final thesis oral assessment.