

## MASTER OF SCIENCE (PROCESS PLANT MANAGEMENT)

### PROGRAMME SPECIFICATIONS

Current globalization trend demands future managers to have the ability to change by shaping a definitive shift toward the development of high growth and sustainable process industry. Thus, the Integrated Process Plant Management Scheme (IPPMS), a modular-based training programme, affords qualified professionals from the chemical and related industries an opportunity to gain the degree of aforementioned competency and working knowledge requisite to affect the transfer, adaptation and integration of new technologies intrinsic to process plant management, future-ready to further spur the surge of national advancement within a global framework.

Master of Science (Process Plant Management) by Taught Course is suitable for any bachelor graduates from science, technology and engineering field. Graduates from other discipline with relevant experiences are also encouraged to apply. Depending on the candidate's background, pre-requisite courses may be imposed to assist the candidate to comprehend more in-depth advanced courses offered.

#### General Information

1. Awarding Institution	Universiti Teknologi Malaysia
2. Teaching Institution	Universiti Teknologi Malaysia
3. Programme Name	Master of Science (Process Plant Management)
4. Final Award	Master of Science (Process Plant Management)
5. Programme Code	MKKL
6. Professional or Statutory Body of Accreditation	MQA
7. Language(s) 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 : 2 years Maximum : 8 years	
Type of Semester	No. of Semesters		No of Weeks/Semester
	Min	Max	
Normal	4	8	14
Short	-		-

### Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	75%
ii.	Programme Core	24	
iii.	Programme elective (1 course)	3	
iv	Master Project	10	25%
<b>Total</b>		<b>40</b>	<b>100%</b>

### Programme Educational Objectives (PEO)

- PEO1: Graduates become the expertise in process plant management discipline and contribute to national development.
- PEO2: Graduates become creative, innovative and adaptable senior engineer in their organization and society.
- PEO3: Graduates contribute toward the environmental well-being and sustainable development.
- PEO4: Graduates able to conduct research to add value to existing products.

### Programme Learning Outcomes (PLO)

- PLO1: Graduates are able to integrate scientific knowledge in the field of process plant management and evaluate (C6) related processes
- PLO2: Graduates are able to construct (P4) research project to explain phenomena studied through master's project in the field of process plant management
- PLO3: Graduates are able to display (P4) the ability to clearly communicate findings, knowledge, recommendations and rationale to peers and experts in the related fields
- PLO4: Graduates are able to demonstrate (A3) universal values in professional practices by displaying truth, intellectual integrity and ethics.

PLO5: Graduates are able to demonstrate (A3) contemporary knowledge to expand enquiring mind and knowledge culture

PLO6: Graduates are able to organize (P4) complex matters (project/research) and identify competitive and workable business plan (KK1)

PLO7: Graduates are able to work (A3) comfortably as members or leaders of a multi-disciplinary groups

### GRADUATION CHECKLIST

To graduate, students must pass all the stated courses in this checklist with minimum B grade. Students must achieve a total of 40 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
<b>UNIVERSITY ELECTIVE</b>					
1	UHAP6013	Seminar Pembangunan Isu-Isu Sosial dan Ekonomi Global	3	3	
2	UHAW6023	Falsafah Sains dan Pembangunan Sosial	3	3	
3	UHAF6033	Kepimpinan Dinamik	3	3	
4	UHAZ6113	Budaya Malaysia I	3	3	
5	UHAZ6123	Budaya Malaysia II	3	3	
6	UHAZ6313	Bahasa Malaysia Akademik I	3	3	
7	UHAZ6323	Bahasa Malaysia Akademik II	3	3	
8	UBSE1123	Organizational Behavior	3	3	
9	UCSM1263	Pengurusan Projek IT	3	3	
10	ULAJ 6013	Japanese Language for Postgraduates	3	3	
TOTAL CREDIT OF UNIVERSITY ELECTIVE			<b>3</b>	<b>3</b>	
<b>PROGRAMME CORE COURSES</b>					
11	MKKL1113	Introduction to Chemical Processes Engineering and industry	3	3	
12	MKKL 1123	Chemical Process & Equipment	3	3	
13	MKKL 1133	Process Operation control & Troubleshooting	3	3	
14	MKKL 1143	Energy Management	3	3	
15	MKKL 1153	Environmental Management Plan	3	3	

16	MKKL 1523	Quality Management	3	3	
17	MKKL 1533	Financial Analysis	3	3	
18	MKKL 2063	Research Methodology and value creation through innovation	3	3	
TOTAL CREDIT OF PROGRAM CORE			<b>24</b>	<b>24</b>	
<b>PROGRAMME ELECTIVE COURSES* (Choose 1)</b>					
19	MKKL1513	Human Factors in Industry	3	3	
20	MKKL1873	Strategic Marketing, Planning, Management	3	3	
TOTAL CREDIT OF PROGRAMME ELECTIVE			<b>3</b>	<b>3</b>	
<b>DISSERTATION</b>					
21	MKKL2004	Project 1	4	4	
22	MKKL2006	Project 2	6	6	
TOTAL CREDIT OF DISSERTATION			<b>10</b>	<b>10</b>	
TOTAL CREDIT TO GRADUATE			<b>40</b>	<b>40</b>	

*\*The courses are offered subjected to availability of the courses for the particular semester in the School of Chemical and Energy Engineering*

## COURSE SYNOPSIS

### CORE COURSES

#### **MKKL1113 - Introduction to Chemical Processes Engineering and Industry**

This course presents the principles of chemical processes that play important roles in the chemical engineering curriculum. It prepares the student to formulate and solve material & energy balance on chemical process systems and lays the foundation for subsequent courses in thermodynamics, unit operations, kinetics, and process dynamics.

#### **MKKL 1123 - Chemical Process & Equipment**

This course organizes and compares different types of chemical processes and equipments involved in the chemical and other physical processing industries such as sedimentation, filtration, absorption, distillation, liquid-liquid extraction, solid-liquid extraction (leaching) and membrane processes. It also deals with design of separation operations using mass transfer principles. A part of the module allows hands-on experience for students to operate some equipments such as filter presses, crystallisation and extraction processes.

#### **MKKL 1133 - Process Operation, Control & Troubleshooting**

This course covers the fundamentals of operation, design and troubleshooting in chemical processes. The course reviews general concepts of process design, modelling and simulation for reaction, separation and heat exchanger network systems. Then, the students will identify and describe control and advanced control systems used in reaction, separation and heat exchanger network systems. Some specific examples that illustrate the trade-offs between steady-state design and dynamic controllability in chemical processes will be

analyzed. A new model-based integrated process design and control methodology to overcome the trade-offs between steady-state design and dynamic controllability for reaction, separation and heat exchanger network systems will be reviewed. At the end, some troubleshooting strategy for reaction, separation and heat exchanger network systems will be reviewed.

### **MKKL 1143 - Energy Management**

This course presents the principles for a holistic approach for energy management in a company setting. It provides strategies and methodologies for setting up a sustainable energy management system in a company and for implementing state-of-the-art energy conservation measures using various analysis tools, involving various process equipment, for thermal as well as electrical energy systems.

### **MKKL 1153 - Environmental Management Plan**

This course aims to provide the student with comprehensive theoretical and practical understanding of factors related to environmental management particularly aspects related to water and air pollution as well as control technologies coherent to meeting regulatory requirements. Topics related to watershed characteristics, water quality parameters, legislations, guidelines, non-point source pollution, Total Maximum Daily Load (TMDL) strategies, and water quality modeling will be discussed. The course will also address principles of wastewater collection, treatment, storage, and disposal. In addition, aspects of air pollution characterization and control are also vital in ensuring the preservation of ambient air quality from potentially detrimental pollution sources due to industrial and commercial activities. Air pollution control engineering is primarily concerned with the control of particulate and gaseous emissions. The relevant technologies developed are therefore coherent to these two constituents and will be discussed in the course.

### **MKKL 1523 – Quality Management**

This module treats quality and reliability as an integral part of all functions of both manufacturing and service organizations. It shows how philosophies, systems, legal aspects, employee involvement and techniques should all contribute to improving quality, reliability, safety and reducing cost.

### **MKKL 1533 – Financial Analysis**

This course module provides an understanding of basic accounting principle, terminology and techniques; so that in their work participants can interpret financial reports and financial information, and apply appropriate management accounting practice, and contribute to departmental financial planning and control effectively.

### **MKKL 2063 - Research Methodology and Value Creation Through Innovation**

In this course the students will be exposed to various aspects of the research process. Students will learn how to conduct research in terms of producing research problems and questions, proposal writing and supervision, writing a

dissertation, literature reviews, research methods and how to ensure ethical integrity when conducting research. Students will also learn how to create value to a product. The module on value creation through 5 disciplines of innovation will be based on SRI International model.

## **ELECTIVE COURSES**

### **MKKL 1513 – Human Factors in Industry**

This course module provides a thorough appreciation of the roles and management of people in the manufacturing industry. It also addresses the issue raised by enhanced technology, changing working practices and the search for higher productivity.

### **MKKL 1873 – Strategic Marketing, Planning, Management**

This course is designed to introduce postgraduate students (working executives) to marketing management, its role and importance of organizational performance in the hyper-competitive, rapid internalization and globalization of the business environment. The course, whilst introducing basic concepts and tools of marketing management, deals with the analysis of marketing mix, marketing opportunities, consumer and business markets.