

MASTER OF SCIENCE (HERBAL TECHNOLOGY)

PROGRAMME SPECIFICATIONS

Master of Science (Herbal Technology) 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.

The programme graduates are able to analyze critically, plan, solve complex problems associated with herbal science and technology and related fields and design plant-wide processes including unit operations leading to a professional qualification that will serve the herbal or phytochemical industry. The graduates will also acquire strategic knowledge on "seed to shelf" concept at the herbal business value chain.

General Information

1. Awarding Institution	Universiti Teknologi Malaysia		
2. Teaching Institution	Universiti Teknologi Malaysia		
3. Programme Name	Master of Science (Herbal Technology)		
4. Final Award	Master of Science (Herbal Technology)		
5. Programme Code	MKKT		
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	-	-
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Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	75%
ii.	Programme Core	27	
iii.	Programme elective (1 course)	-	
iv	Master Project	10	25%
	Total	40	100%

Programme Educational Objectives (PEO)

PEO1: The ability to analyze critically, plan, solve complex problems associated with herbal science and technology and related fields and design plant-wide processes including unit operations leading to professional herbal qualification.

PEO2: The ability to communicate effectively, advocate their ideas and practice professional, ethical, environmental and societal responsibilities irrespective of different global and cultural perspectives

PEO3: The ability to easily adapt to different roles, responsibilities, surroundings and communities, enabling them to contribute and lead in their organizations and society at large.

PEO4: The ability to be lifelong learners who are able to demonstrate business acumen and higher-order thinking skills needed to solve problems through innovation and creativity

Programme Learning Outcomes (PLO)

PLO1 : Graduates are able to integrate scientific knowledge in the field of herbal technology 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 herbal technology

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 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
UNIVERSITY ELECTIVE COURSES					
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			3	3	
PROGRAMME CORE COURSES					
11	MKKT1013	Botany And Herbal Chemistry	3	3	
12	MKKT1023	Herbal Quality Management	3	3	
13	MKKT1033	Herbal Processing	3	3	
14	MKKT1043	Product Formulation	3	3	
15	MKKT1053	Practical Science And Herbal Technology	3	3	
16	MKKT 2013	Herbal Cosmeceutical	3	3	
17	MKKT 2023	Nutraceutical And Functional Food	3	3	
18	MKKT2053	Legislation And Registration Of Herbal Product	3	3	

19	MKKT2063	Research Methodology And Value Creation Through Innovation	3	3	
TOTAL CREDIT OF PROGRAM CORE			27	27	
PROGRAMME ELECTIVE COURSES* (none)					
DISSERTATION					
20	MKKT 2014	MASTER PROJECT 1	4	4	
21	MKKT 3016	MASTER PROJECT 2	6	6	
TOTAL CREDIT OF DISSERTATION			10	10	
TOTAL CREDIT TO GRADUATE			40	40	

**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

MKKT 1013 - Botany and Herbal Chemistry

In this course the students will learn about botany, identification of medicinal plants and phytochemistry. The course emphasizes on plant active compounds which mainly are the secondary metabolites from natural sources such as phenolics, steroids, terpenoids, glycosides and alkaloids.

MKKT 1023 - Herbal Quality Management

Every herbal product must be subjected to quality assurance and quality control before it can be commercialized. In this course, students will learn about quality, quality management, quality control, standardization procedures of herbal products, good manufacturing practices and hazard and operability study (HAZOP).

MKKT 1033 - Herbal Processing

Herbal processing is an integral part of herbal product development. In this course, students will learn about herbal processing complete cycle starting from cultivation and collection of plant materials, reprocessing, processing, packaging and finally good manufacturing practices.

MKKT 1043 - Product Formulation

Product formulation is a very important part of herbal product development. Herbal product can be marketed under different dosage forms. In this course students will learn the fundamental of product formulation and other aspects of product formulation such as dosage forms, stability testing, and various types of herbal products

MKKT 1053 - Practical Science and Herbal Technology

There are many unit operations involved in developing an herbal product. During this course, students will be able to conduct different experiments related to herbal processing, product formulation and QC. This knowledge will

help the students in developing herbal products.

MKKT 2013 - Herbal Cosmeceutical

Cosmeceuticals refers to the combination of cosmetics and pharmaceuticals. Basically, cosmeceuticals are cosmetics containing active ingredients that are capable of altering the structure and function of the body. In this course students will learn about skin physiology, hair physiology and natural active ingredients that can be used for skin and hair health.

MKKT 2023 - Nutraceutical and Functional Food

For this course, nutraceuticals are defined as natural active ingredients that have nutritional and physiological benefits and are sold in medicinal forms. Students will learn how nutraceuticals are metabolized in the body, the bioavailability and pharmacokinetics of nutraceuticals, their safety and the different classes of nutraceuticals.

MKKT 2053 - Legislation and Registration of Herbal Product

Legislation of herbal products is important to ensure that the herbal products introduced into the market are safe for human use. In this course, students learn about the different legislation on herbal products according to different continents or countries. Students will also learn about various tests that must be conducted to ensure safety and prove efficacy of the herbal products. A case study on the registration process of herbal products in Malaysia will also be included in this course.

MKKT 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 discipline of innovation will be based on SRI International model.