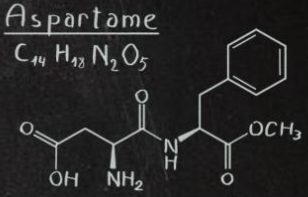
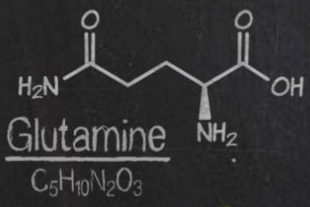
POLITEKNIK
MALAYSIA
TUN SYED NASIR



PROGRAM HANDBOOK

DIPLOMA IN FOOD TECHNOLOGY



DEPARTMENT OF CHEMICAL & FOOD TECHNOLOGY

POLITEKNIK
TUN SYED NASIR SYED ISMAIL

DIPLOMA IN FOOD TECHNOLOGY

PROGRAM INTRODUCTION

The food-processing sector accounts for about 10% of Malaysia's manufacturing output. Processed foods are exported to more than 200 countries, with an annual export value of about RM25 billion in 2016. However, the dependency on food imports continues to make Malaysia a net importer with annual import of more than RM40 billion for the same year. Therefore, re-establishing the food processing industry and supplying sufficient and competent human resource are becoming essentials in order to sustain the food supply. At present, there is an undersupply of TVET workers in 10 of the 12 National Key Economic Area (NKEA) sectors as stated in the Malaysia Education Blueprint 2015-2025, and this would be compensated with a 2.5-fold increase in TVET enrolment by 2025 (Economic Transformation Programme).

Diploma in Food Technology programme is designed to provide students with multidisciplinary studies in food science, food technology, food quality analysis, and research and innovation. These courses are tailored to produce creative, innovative and productive graduates who are not only able to meet but also exceed the food industry expectations.

SYNOPSIS

Diploma in Food Technology programme is designed to produce graduates that have knowledge and skills in the field of food technology to meet the increasing demand of food industry, or being successful entrepreneurs. The programme structure focuses on the areas of food science, food technology, food quality analysis, and research and innovation.

JOB PROSPECT

This programme provides the knowledge and skills in food technology that can be applied to a broad range of careers in food industry. The knowledge and skills that students acquire from the programme enable them to find positions in the job market as:

a. Food Technologist Assistant
b. Quality Control Executive
c. Production Executive
d. Production Supervisor
e. Quality Assurance Supervisor
f. Microbiologist Assistant
g. Food Analyst Assistant
h. Food Inspector Assistant
i. Research Officer Assistant
j. Entrepreneur

PROGRAMME AIMS

This program believes that every individual has potential to foster responsible, creative and innovative senior assistant food technologist in supporting the country aspiration towards becoming a regional food production and distribution hub.

PROGRAMME EDUCATIONAL OBJECTIVE (PEO)

Diploma in Food Technology should produce Food Technologist Assistant who are:

PEO1 : apply basic knowledge, understanding and technical skills of food technology in providing solution for food related issues and challenges.

PEO2 : integrate values, attitudes, professionalism and social skills in engaging with the society and stakeholders.

PEO3 : adopt the roles of a leader and a team member and communicate effectively in providing scientific creative solutions for food technology problems.

PEO4 : engaged in activities to embark entrepreneurial skills for career advancement and innovatively assist to manage resources and information.

PROGRAMME LEARNING OUTCOMES (PLO)

Upon completion of this programme, students should be able to:

PLO1: apply fundamental knowledge of food science and technology to assist in providing solution to food and related industry

PLO2: display food science and technology manipulative skills that are appropriate for the food and related industry

PLO3: demonstrate social skills and responsibilities in food and related industries

PLO4: perform positive values, ethics and accountability in engaging with society

PLO5: demonstrate effective communication and taking alternate role as a leader and a member of a diverse teams

PLO6: classify issues and solutions in food industry by employing appropriate and relevant scientific approaches

PLO7: demonstrate information management and lifelong learning skills in food and related industries

PLO8: develop entrepreneurial and good managerial skills in food and related industries

PROGRAMME STRUCTURE (SEM 1 - SEM 6)

CLASSIFICATION	COURSE CODE	COURSE NAME	CONTACT HOURS				CREDIT	PROGRAMME LEARNING OUTCOME (PLO)									PREREQ
								PLO1	PLO2	PLO3	PLO4	PLO5		PLO6	PLO7	PLO8	
			L	P	T	O		Knowledge	Practical Skills	Social skills & responsibilities	Values, attitudes & proffesionalism	Communication, leadership & team work skills		Problem-solving & scientific skills	Information management & life-long learning skills	Manegerial & Entrepreneural skills	
								CLS1	CLS3a	CLS3d	CLS5	CLS3b	CLS3d	CLS2	CLS3c	CLS4	
SEMESTER 1																	
Compulsory	MPU21032	Peng hayatan Etika d an Perad ab	1	0	2	0	2				√					√	
	MPU24XX1	Unit Berunifo rm 1	0	2	0	0	1						√			√	
	MPU24XX1	Sukan															
Co mmo n Co re	DUW10012	Occup atio nal, Safety and Healt	2	0	0	0	2	√			√	√					
	DBM10133	Mathematics fo r Techno lo g y	2	0	2	0	3	√				√			√		
Discip line Co re	DMT10013	Fund amentals o f Chemistry	2	3	0	0	3	√	√	√							
	DMT10023	Fund amentals o f Micro b io lo g y	2	3	0	0	3	√	√	√							
	DMT10032	Intro d uctio n to Fo o d Ind ustry	2	0	1	0	2	√		√							
TOTAL			24				16										
SEMESTER 2																	
Compulsory	DUE10 0 12	Co mmunicative Eng lish 1	1	0	2	0	2					√				√	
	MPU24XX1	Kelab / Persatuan	0	2	0	0	1						√			√	
	MPU24XX1	Unit Berunifo rm 2															MPU24XX1
Discip line Co re	DMT20043	Org anic Chemistry	2	2	0	0	3	√	√				√				
	DMT20053	Fo o d Chemistry	2	2	0	0	3	√	√	√							
	DMT20063	Fo o d Micro b io lo g y	2	3	0	0	3	√	√	√							DMT10023
	DMT20073	Fo o d Preservatio n and	2	0	2	0	3	√	√		√						
	DMT20082	Co ncep t o f Halal Fo o d	2	0	0	0	2	√		√							
TOTAL			24				17										
SEMESTER 3																	
Compulsory	MPU22012	Entrep reneurship	1	0	2	0	2					√				√	
	DUE30022	Co mmunicative Eng lish 2	1	0	2	0	2					√				√	DUE10 0 12
Co mmo n Co re	DUG30023	Green Techno lo g y Co mp liance	2	0	2	0	3		√			√		√			
Discip line Co re	DMT30093	Fo o d Quality Assurance	2	2	0	0	3	√	√						√		
	DMT30103	Animal Pro d ucts Techno lo g y	2	3	0	0	3	√	√							√	
	DMT30113	Plant Pro cess Techno lo g y	2	3	0	0	3	√	√							√	
TOTAL			24				16										

SEMESTER 4																	
Co mp ulso ry	DUE50 0 3 2	Co mmunicative Eng lish 3	1	0	2	0	2					√				√	DUE30022
Disciplin e Co re	DMT4 0 12 3	Fats and Oils Techno lo g y	2	2	0	0	3		√					√	√		
	DMT4 0 13 3	Instrumental Analysis o f Fo o d	2	2	0	0	3	√	√						√		
	DMT4 0 14 3	Statistics in Senso ry Evaluatio n fo r Fo o d Science	2	2	1	0	3		√	√				√			
	DMT4 0 153	Fo o d Pro d uct Inno vatio n	1	4	0	0	3		√		√			√		√	
	DMT4 0 16 2	Seminar	1	0	2	0	2				√				√		
Electives		Elective 1					2										
TOTAL			24				18										
SEMESTER 5																	
Compulsory	MPU2 3 0 52	Sains, Tekno lo g i d an Kejuruteraan Dalam Islam *	1	0	2	0	2				√					√	
	MPU23042	Nilai Masyarakat Malaysia **															
Disciplin e Co re	DMT50 174	Fo o d Safety Manag ement	2	0	4	0	4		√			√		√		√	
	DMT50 18 3	Fo o d Pro cess and Plant Desig n	2	3	0	0	3		√					√		√	
	DMT50 19 4	Pro ject	0	8	0	0	4				√		√	√		√	DMT40162
Electives		Elective 2					3										
TOTAL			22				16										
SEMESTER 6																	
Ind ustrial Training	DUT6 0 0 19	Ind ustrial Training	0	0	0	0	9		√	√	√	√	√		√	√	

	Total Credit	%
i. (a) Compulsory	14	15%
(b) Compulsory (Bahasa Kebangsaan A)[b]	2[b]	0%
ii. Common Core	8	9%
iii. Discipline Core	56	61%
iv. Specialization	0	0%
Total Credit	78	
v. (a) Elective	5	5%
(b) Free Electives[a]	2[a]	0%
vi. Industrial Training	9	10%
Grand Total Credit	**92**	**100%**

	Total Hours	%
i. Lecture	34	40%
ii. Practical	42	49%
iii. Tutorial	10	12%
Total Contact Hours	86	100%

SEMESTER	COURSE	CREDIT	PREREQUISITE	SYNOPSIS	CLO
1	DMT10013 FUNDAMENTAL OF CHEMISTRY	3	-	INORGANIC AND PHYSICAL CHEMISTRY introduces the basic concepts of matter, chemical state, periodic table, stoichiometry, chemical bonding, acid and base, redox reaction and chemical equilibria	**1.** Explain the basic principles of inorganic and physical chemistry regarding matter, the Periodic Table, chemical bonds, volumetric analysis, redox reactions, the properties of acids and bases in aqueous solution as well as the concepts of dynamic chemical equilibrium and chemical kinetics. (C2 , PLO 1) **2.** Perform practical skills in laboratory experiments (P3 , PLO 2) **3.** Join in class activities and act responsibly as a team member (A3 , PLO 3)

	DMT10023 FUNDAMENTAL OF MICROBIOLOGY	3	-	FUNDAMENTALS OF MICROBIOLOGY consist of principles of microbiology, characteristics and classification of microorganisms, ecology of microorganisms, cell metabolism, factors controlling growth and reproduction of the microorganisms, cultivation and microorganism control.	**1.** Describe fundamental knowledge of microbiology regarding on microbial structure, growth and control to assist in providing solution to food industry. (C2, PLO 1) **2.** Demonstrate basic microbiology experiment that are appropriate for the food industry (P3, PLO 2) **3.** Demonstrate teamwork and responsibilities in laboratory activities and act responsibly as a team member (A3, PLO 3)

	DMT10023 INTRODUCTION TO FOOD INDUSTRY	2	-	INTRODUCTION TO FOOD INDUSTRY covers various categories of food industryas well as common food processing methods. It also includes relevant agencies suchas government and non-government parties and their functions involved in food industry in Malaysia. Food law and regulation, food technologies issues and green technology are also discussed.	**1.** Describe the scope of food industry, food processing and food safety. (C2, PLO 1) **2.** Demonstrate social skill, incorporates elements of good teamwork, through CDIO project related in food industry. (A3, PLO 3)
2	DMT20043 ORGANIC CHEMISTRY	3	-	ORGANIC CHEMISTRY covers the study of organic compounds, beginning with the IUPAC system of nomenclature, classification, molecular structure, physical properties and common applications of organic compounds. Subsequently students study the common types of chemical reactions encountered in organic chemistry, followed by the phenomenon of isomerism.	**1.** Explain the functional group in organic chemistry, name correctly organic compound using IUPAC nomenclature, the reaction and the isomerism in organic chemistry (C2, PLO1) **2.** Perform practical skills in laboratory experiments. (P3, PLO 2) **3.** Join class activities and act responsibly as a team member. (A3, PLO 3)

	DMT20053 FOOD CHEMISTRY	3	-	FOOD CHEMISTRY covers the chemical processes and interactions of food components such as carbohydrates, protein, lipids, and water. This course also encompasses how the components change under certain conditions or treatments and ways either to enhance or to prevent them from happening. Common laboratory works related to this discipline are also undertaken.	1. Explain the composition of foods and their chemical and physical characteristics as they undergo processing, storage, and handling. (C2, PLO 1) 2. Display practical skills in basic food chemistry laboratory experiments. (P2, PLO 2) 3. Participate in class activities and act responsibly as a team member. (A2, PLO 3)

	DMT20063 FOOD MICROBIOLOGY	3	DMT10023 FUNDAMENTAL OF MICROBIOLOGY	FOOD MICROBIOLOGY covers the characteristics and nature of microorganisms in food; factors affecting the rate of growth; microbiological aspect of food processing and food preservation; food spoilage, food-borne diseases and microorganisms as indicators of food safety.	**1.** Apply fundamental knowledge of microorganisms in food, food-borne diseases, food spoilage, food-borne diseases and microbial analysis technique relating to food products. (C3, PLO1) **2.** Perform basic microbiology experiment production through laboratory group work (P3, PLO2) **3.** Demonstrate teamwork in laboratory activities and act responsibly as a team member. (A3, PLO 3)

	DMT20073 FOOD PRESERVATION AND LEGISLATION	3	-	FOOD PRESERVATION & LEGISLATION provides the fundamental understanding of food preservation techniques that are used to preserve the quality of foods through the application of heat processing, refrigeration and freezing, dehydration, fermentation and chemical preservation. In addition, the new and emerging preservation technologies will also be considered. The course also covers food law and legislation which enables the students to gain knowledge about the requirements of the Food Act 1983, Food Regulations 1985 and other relevant laws associated with foods.	1. Explain the basic principles of Food Preservation and Legislation regarding preserving the quality of food through the preservation techniques. (C2, PLO 1) 2. Display preservative techniques through cooperative learning (P3, PLO 2) 3. Demonstrate the ability to independently search for information or solution to a problem encountered. (A2, PLO 4)

	DMT20082 CONCEPT OF HALAL FOOD	2	-	CONCEPT OF HALAL FOOD covers the shariah principles and halal requirements for the sustainability concept of hygiene, sanitation and safety aspect, make Halal food readily acceptable by consumers.	1. Explain shariah principles and halal requirements. (C2, PLO 1) 2. Respond to current halal issues that are appropriate for the food industry. (C3, PLO 3)

3	DMT30093 FOOD QUALITY ASSURANCE	3	-	FOOD QUALITY ASSURANCE consists of introduction to quality and food quality control, quality specification, procedures of quality control, sampling, testing methods, recording and reporting in food quality analysis.	1. Apply the knowledge of food assurance in food technology industry. (C3, PLO1) 2. Perform practical skills for food quality assurance. (P3, PLO2) 3. Demonstrate good information retrieval and management with autonomous learning toward food quality assurance. (A3, PLO7)

	DMT30103 ANIMAL PRODUCTS TECHNOLOGY	3	-	ANIMAL PRODUCTS TECHNOLOGY contains the basic principles of processing animal-based products such as meat, poultry, milk, egg, fish and shellfish product. This course also exposes students to the processing method, equipment operation used and quality control of the products.	1. Apply generally the method, ingredients and their functions involved in the processing operation of meat, poultry, milk, dairy, fish, shellfish, egg as well as their products. (C3, PLO1) 2. Follow procedure to produce selected product and write a report in laboratory group work. (P3, PLO2) 3. Demonstrate creativity and initiative in the application of knowledge in entrepreneurial practices/skill. (A3, PL08)

	DMT30113 PLANT PROCESS TECHNOLOGY	3	-	PLANT PROCESS TECHNOLOGY covers the concept and application of three main topics namely fruits and vegetables, cereals and beverages. The processing of fruits and vegetables consist of canning, freezing, drying, juice production and jam making. Rice, wheat and their products will be covered under cereals while soft drinks, tea and coffee processing covered under beverages. Overall it looks into the method, functions of ingredients as well as the quality control involved.	1. Apply the concept in plant process technology to solve problems pertaining to the processing of plant products. (C3, PLO1) 2. Produce selected plant products through laboratory group work.(P3, PLO2) 3. Demonstrate positive entrepreneurial skills in producing selected plant product through team work. (A3, PLO8)

4	DMT40123 FATS AND OILS TECHNOLOGY	3	-	FATS AND OILS TECHNOLOGY provides knowledge of the fats and oils, their physical and chemical characteristics, processing techniques, analysis as well as the environmental impacts.	1. Analyze the issues and challenges in fats and oils technology and solve the problems by scientific and thinking skills. (C4, PLO6) 2. Perform practical skills for related fats and oils analysis in the food industry. (P3,PLO 2) 3. Demonstrate good information retrieval and management, autonomous learning and inquisite mind towards fats and oils technology. (A3, PLO7)
	DMT40133 INSTRUMENTAL ANALYSIS OF FOOD	3	-	INSTRUMENTAL ANALYSIS OF FOOD introduces the concept of analytical chemistry and familiarizes students to at least four major instruments used in food analysis. Familiarization to the instruments include introduction to the techniques, basic principles, schematic diagrams, methods, preparation of standards and samples, precautions and application in food analysis. Emphasis is given to the acquisition of basic practical skills in preparation and handling of selected analytical instrument.	1. Explain briefly the techniques, general principles and application of different instruments in food analysis according to appropriate methods. (C3, PLO1) 2. Perform practical skills and techniques in conducting food analysis in the laboratory. (P3, PLO2) 3. Demonstrate lifelong learning skills while conducting practical work or other assigned work. (A3, PLO7)

	DMT40143 STATISTICS IN SENSORY EVALUATION FOR FOOD SCIENCE	3	-	STATISTICS AND SENSORY EVALUATION FOR FOOD SCIENCE will provide students with basic principle of statistics and sensory evaluation. It also introduces the requirement and methods for sensory evaluation, descriptive statistic and inferential statistics which commonly used in the field of science and technology. Students will be able to describe and analyze sensory evaluation test data in food science and food technology- related situations through application of the knowledge and skills gained	1. Analyze sensory evaluation data using basic statistical concept (C4, PLO6) 2. Perform sensory evaluation test and analyze data collected using appropriate methods. (P3, PLO2) 3. Demonstrate social skills and responsibilities in sensory evaluation. (A3, PLO3)

	DMT40153 FOOD PRODUCT INNOVATION	3	-	FOOD PRODUCT INNOVATION consists of the method and procedure to produce new food product, starting from product strategy, product design, process development, product commercialization and product launching.	1. Figure out scientific and technical problems encountered during the product development process. (C4, PLO6) 2. Produce innovative product through a concept of product development. (P4, PLO2) 3. Display positive values, ethics and accountability during the development process (A5, PLO4) 4. Perform good managerial skills for product development process until product launching. (A2, PLO8)
	DMT40162 SEMINAR	2	-	SEMINAR provides students with solid foundation on knowledge and skills in preparing project proposal. Atthe end of the study, the project proposal will be presented for evaluation purposes.	1. Integrate positive attitude and professionalism in construction verbal and non-verbal communication (A4, PLO4) 2. Demonstrate autonomous learning along with retrieving and managing information in evaluating writing the proposal. (A3, PLO7)

5	DMT50174 FOOD SAFETY MANAGEMENT	3	-	FOOD SAFETY course covers the sources of food contamination and poisoning, food borne diseases, relevant control measures; principles and practices of personal hygiene cleaning and sanitation. Student will learn the basic concepts of GHP, GMP and HACCP principles and developing HACCP management system for food industry.	1. Analyze issues and problems by employing relevant scientific approaches to develop food safety management system. (C4, PLO6) 2. Perform food science and technology that are appropriate with food safety management system for food industry. (P4, PLO5) 3. Demonstrate effective communication in verbal and written discourse in engaging with food safety management system for food industry. (A4, PLO5) 4. Demostrate good managerial and entrepreneurial skills in engaging with food safety management system. (A4, PLO8)

	DMT50183 FOOD PROCESS AND PLANT DESIGN	3	-	FOOD PROCESS AND PLANT DESIGN involves the unit operations in food industries which is apply the engineering principles and techniques and also with the relevant standard of a particular process. The relationship among these unit operations can be shown in process diagram. It consists of introduction in food process design, basic principles of related equipment for each unit operations in food processing, hygienic plant design, plant layout and plant safety.	1. Organize problem solving and scientific skill of methods and engineering principles in food processing and plant design. (C4, PLO6) 2. Display effective practical skill in food processing laboratory experiment. (P3, PLO2) 3. Organize good managerial with systematic planning in food plant process. (A4, PLO8)

	DMT50194 PROJECT	4	DMT40162 SEMINAR	PROJECT is a laboratory based study that requires the student to carry out a research project in the field of food science and technology. It outlines the basic principles involved in the selection and choice of a research topic, the scope of the research, planning and conducting the project. The findings of the study will be written as a report as well as presented for evaluation.	1. Evaluate the issue and problems to provide solution for scientific research in food science and technology. (C5, PLO6) 2. Integrate positive values, ethics and accountability while conducting research. (A4, PLO4) 3. Display leadership and teamwork skills in preparing and delivering oral presentations. (A3, PLO5) 4. Demonstrate managerial skills and organizing in conduction research and report writing. (A4, PLO8)