



**UNIVERSITI  
KUALA LUMPUR**

**Malaysian Institute of Chemical &  
Bioengineering Technology**

**Programme Handbook  
Intake June 2016**

***Disclaimer:***

*The Programme Handbook Intake 2016  
is meant for the students for Intake 2016.*

*Universiti Kuala Lumpur and  
Malaysian Institute of Chemical & Bioengineering Technology  
(UniKL MICET) reserves the right to change the content without prior notice.*

**UniKL Vision:**

To be the Leading Enterpreneurial Technical University

**UniKL Mission:**

To Produce Enterprising Global Technopreneurs

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## PROCESS ENGINEERING TECHNOLOGY SECTION

### Introduction

Diploma in Chemical Engineering Technology (Process) at UniKL MICET exists to outfit semi-skilled process technologists as prominent workers that emphasize more on hands-on ability in each related field or industry. Besides their competence, students are also given priorities to have a better view on environmental awareness. We will also equip our students with knowledge of non-technical subjects such as technical communication which is important to process technologists for developing the chemical industries in Malaysia.

In our 3-year program, we offer hands-on experience in a lot of industrial-like equipment thus our graduates will be able to compete in the technological and industrial world. Apart from the basic chemical engineering knowledge in mass and heat transfers, unit operations, fluid mechanics and process control, students will be specialized in petrochemical and natural gas processing, oleochemical and other industrial chemical processes.

Students will experience the real industrial environment in the basic laboratories to the pilot plants. They will also be given the opportunities to manufacture their own soap and margarine for example, refine palm oil and design an experiment to fulfill their final year project requirements.

Since a chemical technologist is a universal technologist, a chemical technology graduate will be able to pursue jobs in a wide variety of industries. A significant number of chemical technology graduates use chemical technology as a foundation for careers in business, administration, law, medicine and other professions. These include:

- Upstream workforce
- Downstream workforce
- Maintenance workforce
- Production and process workforce
- Research and laboratory workforce

**DIPLOMA IN CHEMICAL ENGINEERING TECHNOLOGY (PROCESS) (C02)****PROGRAMME EDUCATIONAL OBJECTIVES**

PEO 1	To produce qualified chemical engineering technologist who will contribute towards the chemical engineering related industry
PEO 2	To produce chemical engineering technologist who demonstrate leadership qualities and responsibilities towards society
PEO 3	To produce chemical engineering technologist with the ability to recognize the need for and engage in lifelong learning
PEO 4	To produce chemical engineering technologist who are capable of embarking on business and entrepreneurial activities

**PROGRAMME LEARNING OUTCOMES**

PLO1	Acquire knowledge of mathematics, science and engineering technology fundamentals in chemical and process engineering technology.
PLO2	Use fundamental engineering techniques, skills and tools in chemical and process engineering technology.
PLO3	Respond to issues related to chemical process engineering technology.
PLO4	Solve scientific problems in terms of unifying principles, designing solutions, analyzing and interpreting data related to chemical and process engineering technology.
PLO5	Communicate effectively with the engineering technology community and society at large.
PLO6	Perform effectively as a team player.
PLO7	Discuss contemporary issues faced by the engineering technologist in global and societal contexts.
PLO8	Identify professional and ethical responsibilities of chemical and process engineering technologists.
PLO9	Demonstrate the ability to manage relevant information from various sources and learn continuously.
PLO 10	Demonstrate understanding of management, business practices and entrepreneurial competencies.
PLO 11	Demonstrate leadership skills with the ability to set direction for team members.

**PROGRAMME STRUCTURE: (subject to amendments)**

NO	CODE	NAME	CLASSIFICATION	CREDIT	PREREQUISITE
<b>Semester 1</b>					
1	WQD 10103	Technical Mathematics 1	UCS	3	
2	CLD 10004	General Chemistry	Core	4	
3	CLD 10102	Engineering Graphic	Core	2	
4	CLD 10202	Computing	Core	2	
5	WED 10402	Competency English	UCS	2	
6	#	Co-Curriculum	MPU	2	
7	WMD 10101	Mandarin 1	UCS(L)	1	
8	MPU2313/ MPU2323	Amalan Islam Di Malaysia / Religious Practices In Malaysia (Non-Muslim / International Student)	MPU	3	
<b>Semester Total</b>				<b>19</b>	
<b>Semester 2</b>					
9	WQD 10203	Technical Mathematics 2	USC	3	WQD 10103 - Technical Mathematics 1
10	CLD 10302	Organic Chemistry	Core	2	CLD 10004 - General Chemistry
11	CLD 10402	Analytical Chemistry	Core	2	CLD 10004 - General Chemistry
12	CLD 10502	Principle of Chemical Process	Core	2	
13	CLD 10603	Fluid Mechanics	Core	3	
14	WED 20202	Communication English 1	UCS	2	WED 10402 - Competency English
15	MPU2163/ MPU2163	Pengajian Malaysia 2/ Bahasa Melayu Komunikasi 1 (International Student)	MPU	3	
16	WGD10103	Interpersonal Skills	UCS	3	
17	MPU2213	Bahasa Kebangsaan (A)	MPU	3*	
18	WMD 10201	Mandarin 2	UCS(L)	1	WMD 10101 - Mandarin 1
<b>Semester Total</b>				<b>21</b>	
<b>Semester 3</b>					
19	CLD 20002	Occupational Safety & Health	Core	2	
20	CLD 20102	Electrical Technology	Core	2	
21	CLD 20202	Process Instrumentation	Core	2	
22	CLD 20302	Thermodynamics	Core	2	
23	CLD 20402	Transport Process	Core	2	CLD 10502 - Principle of Chemical Process
24	CLD 20502	Basic Engineering Workshop	Core	2	
25	MPU 2222	Introduction to Entrepreneurship	MPU	2	
26	WED 20302	Communication English 2	UCS	2	WED 20202 - Communication English 1
27	CLD 21102	Technical Mathematics 3	UCS	2	WQD 10203 - Technical Mathematics 2
<b>Semester Total</b>				<b>18</b>	

<b>Semester 4</b>					
28	CPD 20002	Plant Utility and Safety	Core	2	
29	CPD 20103	Petrochemical & Petroleum Refining Technology	Core	3	
30	CPD 20202	Environmental Control and Management	Core	2	
31	CPD 20302	Process Control	Core	2	
32	CPD 20402	Pilot Plant 1	Core	2	
33	CKD 20002	Reactor Technology	Core	2	CLD 10502 - Principle of Chemical Process
34	CKD 20103	Separation Technology	Core	3	CLD 10502 - Principle of Chemical Process
		<b>Semester Total</b>		<b>16</b>	
<b>Semester 5</b>					
35	CPD 30002	Quality Assurance and Quality Control	Core	2	
36	CPD 30103	Plant Maintenance and Inspection	Core	3	
37	CPD 30203	Oil & Fat Process Technology	Core	3	
38	CPD 30302	Pilot Plant Operation 2	Core	2	
39	WPD 39806	Final Year Project	FYP	6	
		<b>Semester Total</b>		<b>16</b>	
<b>Semester 6</b>					
40	WID 39908	Industrial Training	INTRA	8	
		<b>Semester Total</b>		<b>8</b>	
		<b>Total Credit to Graduate</b>		<b>98</b>	

**\* Applicable for Malaysian Students**

Students must register and pass subject MPU3213 Bahasa Kebangsaan A before graduation if attain grade D and E in Bahasa Melayu at SPM level and never passed Bahasa Kebangsaan A in their previous programme. Other conditions, refer to your Academic Advisor. Students under this category will graduate with additional of 3 credits on top of TCG.

**# Co-Curriculum Courses**

NO	CODE	NAME	CLASSIFICATION	CREDIT
1	MPU2412	CAREER GUIDANCE 1	MPU	1
2	MPU2422	COMMUNITY SERVICE 1	MPU	1
3	MPU2432	CULTURE 1	MPU	1
4	MPU2442	RAKAN MASJID 1	MPU	1
5	MPU2452	SISWA-SISWI BOMBA DAN PENYELAMAT 1	MPU	1
6	MPU2462	SISWA-SISWI PERTAHANAN AWAM1	MPU	1
7	MPU2472	SPORTS MANAGEMENT 1	MPU	1
8	MPU2482	PERSONAL FINANCIAL MANAGEMENT 1	MPU	1



## **FOOD ENGINEERING TECHNOLOGY SECTION**

### **Introduction**

This programme introduces the field of food science and technology, the sciences used to provide knowledge for food technology and the importance of food in providing proper nutrition. It also provides students with theoretical and practical, hands-on skills in nutrition, food chemistry, food microbiology, analysis of food, instruments used for food sample analysis, food packaging, food preservation, toxicology and post harvested technology in food.

The students may study more fundamental phenomena that are directly linked to the production of particular food product and its properties. The study of food science and technology emphasizes on the composition of foods and the changes that occur when they are subjected to food processing. Functional foods are foods that promote health beyond providing basic nutrition. Safety of food is a basic requirement of food quality. "Food safety" implies absence or acceptable and safe levels of contaminants, adulterants, naturally occurring toxins or any other substance that may make food injurious to health on an acute or chronic basis.

Food quality can be considered as a complex characteristic of food that determines its value or acceptability to consumers. Besides safety, quality attributes include: nutritional value; organoleptic properties such as appearance, colour, texture, taste; and functional properties. Examples of the activities of food technologists include the development of new food products, design of processes to produce these foods, choice of packaging materials, shelf-life studies, sensory evaluation of the product with trained expert panels or potential consumers, as well as microbiological and chemical testing.

Careers: Graduates work in all sizes of food processing companies as food technologist focuses on food safety, quality control and other related to food production.

**DIPLOMA IN CHEMICAL ENGINEERING TECHNOLOGY (FOOD) (C04)****PROGRAMME EDUCATIONAL OBJECTIVES**

PEO 1	To produce qualified chemical engineering technologist who will contribute towards the chemical engineering related industry
PEO 2	To produce chemical engineering technologist who demonstrate leadership qualities and responsibilities towards society
PEO 3	To produce chemical engineering technologist with the ability to recognize the need for and engage in lifelong learning
PEO 4	To produce chemical engineering technologist who are capable of embarking on business and entrepreneurial activities

**PROGRAMME LEARNING OUTCOMES**

PLO1	Acquire knowledge of mathematics, science and engineering technology fundamentals in chemical and food engineering technology.
PLO2	Use fundamental engineering techniques, skills and tools in chemical and food engineering technology.
PLO3	Respond to issues related to chemical food engineering technology.
PLO4	Solve scientific problems in terms of unifying principles, designing solutions, analyzing and interpreting data related to chemical and food engineering technology.
PLO5	Communicate effectively with the engineering technology community and society at large.
PLO6	Perform effectively as a team player.
PLO7	Discuss contemporary issues faced by the engineering technologist in global and societal contexts.
PLO8	Identify professional and ethical responsibilities of chemical and food engineering technologists.
PLO9	Demonstrate the ability to manage relevant information from various sources and learn continuously.
PLO 10	Demonstrate understanding of management, business practices and entrepreneurial competencies.
PLO 11	Demonstrate leadership skills with the ability to set direction for team members.

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8	MPU2313/ MPU2323	Amalan Islam Di Malaysia / Religious Practices In Malaysia (Non-Muslim / International Student)	MPU	3	
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23	CLD 20402	Transport Process	Core	2	CLD 10502 - Principle of Chemical Process
24	CLD 20502	Basic Engineering Workshop	Core	2	
25	MPU 2222	Introduction to Entrepreneurship	MPU	2	
26	WED 20302	Communication English 2	UCS	2	WED 20202 - Communication English 1
27	CLD 21102	Technical Mathematics 3	UCS	2	WQD 10203 - Technical Mathematics 2
<b>Semester Total</b>				<b>18</b>	

<b>Semester 4</b>					
28	CFD20203	FOOD MICROBIOLOGY	Core	3	
29	CFD20302	FOOD CHEMISTRY	Core	2	
30	CFD30003	FOOD ANALYSIS	Core	3	
31	CFD30303	SENSORY EVALUATION OF FOOD	Core	3	
32	CKD 20002	Reactor Technology	Core	2	CLD 10502 - Principle of Chemical Process
33	CKD 20103	Separation Technology	Core	3	CLD 10502 - Principle of Chemical Process
<b>Semester Total</b>				<b>16</b>	
<b>Semester 5</b>					
34	CFD20002	QUALITY ASSURANCE & QUALITY CONTROL IN FOOD INDUSTRIES	Core	2	
35	CFD20103	FOOD PROCESSING TECHNOLOGY	Core	3	
36	CFD30103	FOOD PACKAGING	Core	3	
37	CFD30202	FOOD SANITATION AND LEGISLATION	Core	2	
38	WPD 39806	Final Year Project	FYP	6	
<b>Semester Total</b>				<b>16</b>	
<b>Semester 6</b>					
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**# Co-Curriculum Courses**

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1	MPU2412	CAREER GUIDANCE 1	MPU	1
2	MPU2422	COMMUNITY SERVICE 1	MPU	1
3	MPU2432	CULTURE 1	MPU	1
4	MPU2442	RAKAN MASJID 1	MPU	1
5	MPU2452	SISWA-SISWI BOMBA DAN PENYELAMAT 1	MPU	1
6	MPU2462	SISWA-SISWI PERTAHANAN AWAM1	MPU	1
7	MPU2472	SPORTS MANAGEMENT 1	MPU	1
8	MPU2482	PERSONAL FINANCIAL MANAGEMENT 1	MPU	1

# **MATA PELAJARAN PENGAJIAN UMUM (MPU) COMPULSORY COURSES**

## **DIPLOMA**

**MPU2313 AMALAN ISLAM DI MALAYSIA  
MPU2323 RELIGIOUS PRACTICES IN MALAYSIA  
MPU2213 BAHASA KEBANGSAAN (A)  
MPU 2222 INTRODUCTION TO ENTERPRENEURSHIP  
MPU 2133 BAHASA MELAYU KOMUNIKASI 1  
MPU 1133 PENGAJIAN MALAYSIA**

**MPU2412 CAREER GUIDANCE 1  
MPU2422 COMMUNITY SERVICE 1  
MPU2432 CULTURE 1  
MPU2442 RAKAN MASJID 1  
MPU2452 SISWA-SISWI BOMBA DAN PENYELAMAT 1  
MPU2462 SISWA-SISWI PERTAHANAN AWAM 1  
MPU2472 SPORTS MANAGEMENT 1  
MPU2482 PERSONAL FINANCIAL MANAGEMENT 1**

### **MPU2313 AMALAN ISLAM DI MALAYSIA**

**Prerequisite:** Nil

**Rationale for inclusion of the course in the program:**

Kursus ini bertujuan melahirkan pelajar yang memahami peranannya sebagai pelajar muslim yang bertanggungjawab dalam membangunkan umah. Oleh itu, kursus ini memdedahkan para pelajar tentang Islam secara holistic sebagai khalifah Allah di atas muka bumi ini.

**Learning Outcomes:**

Setelah tamat kursus ini, pelajar akan dapat:

1. Menghuraikan konsep manusia dan agama, asas-asas Islam dan sejarah kedatangan agama Islam di Malaysia.
2. Meerangkan keistimewaan Islam melalui institusi pendidikan, kekeluargaan, ekonomi dan pentadbiran di Malaysia.
3. Menjelaskan isu-isu semasa dalam masyarakat berlandaskan ajaran Islam.

### **MPU2323 RELIGIOUS PRACTICES IN MALAYSIA**

**Prerequisite:** Nil

**Rationale for inclusion of the course in the program:**

This course is to enable students to understand their roles in developing the nation. It also provides exposure on the influence of religions on the lives of Malaysians. Students should also be able to understand their roles as members of the society according to the constitutions of Malaysia.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Elaborate the concept of man and religion
2. Describe the practices of religion as stated in Malaysian constitution
3. Explain current issues related to various religions practiced in Malaysia.

### **MPU2213 BAHASA KEBANGSAAN (A)**

**Prerequisite:** Nil

**Rationale for inclusion of the course in the program:**

Mata pelajaran Bahasa Kebangsaan (A) ini disediakan untuk mempertingkatkan kecekapan berbahasa, sesuai dengan intelek pelajar untuk berkomunikasi dengan berkesan secara lisan dan tulisan dalam konteks rasmi, kreatif dan bukan kreatif.

**Learning Outcomes:**

Setelah tamat kursus ini, pelajar akan dapat:

1. Mengetahui asal usul dan perkembangan Bahasa Melayu
2. Berkomunikasi secara lisan dengan berkesan dari segi sebutan dan intonasi,serta
3. menggunakan struktur tatabahasa yang betul
4. Menghasilkan pelbagai jenis teks dengan bahasa yang betul dan berkesan serta berkomunikasi secara lisan dan bertulis dengan sopan
5. Mengaplikasikan penggunaan bahasa dalam pelbagai situasi.

### **MPU 2222 INTRODUCTION TO ENTREPRENEURSHIP**

**Prerequisite:** Nil

**Rationale for inclusion of the course in the program:**

This course aims to prepare students with the main characteristics of an entrepreneur and provide basic knowledge and skills in establishing a small venture.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Describe entrepreneurship value and culture
2. Demonstrate the ability to assess business environment
3. Identify entrepreneurship opportunity and starting up a business
4. Develop a business idea.

### **MPU 2133 BAHASA MELAYU KOMUNIKASI 1**

**Prerequisite:** Nil

**Rationale for inclusion of the course in the program:**

Kursus ini adalah untuk membolehkan pelajar menguasai kemahiran asas Bahasa Melayu dan kecekapan berbahasa untuk berkomunikasi bagi melahirkan idea dan perasaan secara lisan dan penulisan.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Mengenalpasti system bunyi, system ejaan rumi, kosa kata dan tatabahasa Bahasa Melayu dalam ayat mudah.
2. Menyebut dan mengeja bunyi vocal, diftong dan kosonan yang didengar dengan betul.
3. Bertutur dan memahami pertuturan dalam pelbagai situasi harian dengan menggunakan ayat mudah.
4. Membaca dan memahami ayat Bahasa Melayu mudah.
5. Menulis karangan pendek berkaitan kehidupan seharian.

### **MPU 1133 PENGAJIAN MALAYSIA**

**Prerequisite:** Nil

**Rationale for inclusion of the course in the program:**

Mata pelajaran ini bertujuan melahirkan pelajar yang memahami peranannya dalam proses pembinaan negara bangsa dan bersemangat patriotik dalam menghadapi cabaran pembangunan.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Menerangkan sejarah negara dan bangsa.
2. Menyatakan perkembangan masyarakat dari aspek sosio budaya, politik dan ekonomi.
3. Menyenaraikan jasa tokoh-tokoh yang terlibat dalam memperjuangkan dan mempertahankan kemerdekaan serta kedaulatan negara.
4. Menggunakan nilai-nilai patriotisme untuk meningkatkan jati diri sebagai rakyat Malaysia.
5. Mengaplikasikan hubungan harmoni dalam masyarakat pelbagai etnik.
6. Menganalisis peranan serta sumbangan Malaysia di peringkat antarabangsa.



**MPU2412 CAREER GUIDANCE 1****Prerequisite: Nil****Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it enables student to understand the important of career planning. It also promotes soft skills that can be applied in their future careers. Apart from that, it creates a better understanding about potential employers' expectations in job hunt.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Differentiate their self-concept, self-image which reflects their personalities
2. Apply appropriate interpersonal skills in building up their own skills
3. Plan future career and targets.

**MPU2422 COMMUNITY SERVICE 1****Prerequisite: Nil****Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it aims to develop interest among the students to participate in community programs. It also enables student to understand the important of performing of community services and the ways to implement the programmes and activities. Besides that, it provides better understanding to the student on the values, ethics and benefits of carrying out community service programmes.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Organize and participate in the community service programmes and activities.
2. Apply knowledge gain in carrying out community service programmes and activities
3. Apply basic entrepreneurship skills in community service programmes and activities
4. Explain the values ethics and benefits of carrying out community service programmes.

### **MPU2432 CULTURE 1**

**Prerequisite: Nil**

**Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it aims to develop students' personalities and social interaction skills, as well as foster closer relationship among the student in the university through the organization of and participation in cultural activities.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply knowledge gained in planning and organizing a cultural event.
2. Apply appropriate skills in participating in a cultural event.
3. Explain the benefits of participating in a cultural activity.

### **MPU2442 RAKAN MASJID 1**

**Prerequisite: Nil**

**Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it aims to develop students who understand their roles as Muslims and are responsible to develop the ummah. This course also aims to expose students to the function of mosque as the main institution in developing the Muslim society.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the beauty of Islam in every aspect in their life.
2. Organize and implement several activities in relation to the Muslim practice.
3. Elaborate the significance of the organized programs.

**MPU2452 SISWA-SISWI BOMBADAN PENYELAMAT 1****Prerequisite: Nil****Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it gives exposure on the introduction to Malaysian Fire Rescue Department, foot marching techniques, fire rescue, ascending and descending technique and basic emergency aid.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Participate actively in Project (theory and practically about BOMBA activities).
2. Communicate and demonstrate leadership and team skills through BOMBA activities (rescue, fire rescue and first aid).
3. Apply appropriate fundamental of rescue, fire rescue and first aid.

**MPU2462 SISWA-SISWI PERTAHANAN AWAM 1****Prerequisite: Nil****Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it gives exposure on the introduction on the instruction to Malaysian Civil Defense Force, foot marching technique, fire rescue, ascending and descending technique and basic emergency aid.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Communicate and demonstrate leadership and team skills through BOMBA activities (rescue, fire rescue and first aid).
2. Participate actively in Project (theory and practically about JPAM activities).
3. Apply appropriate fundamental of rescue, fire rescue and first aid.

## **MPU2472 SPORTS MANAGEMENT 1**

**Prerequisite: Nil**

**Rationale for inclusion of the course in the program:**

This course is one of the co-curriculum modules offered to develop well-rounded individuals through involvement in social and community activities. Specifically, it aims to provide students with adequate information and understanding on the implementation and rules in sports management. This course also explores various aspects of sports management namely scope, basic principles, technique and current issues pertaining to sport management.

**Learning Outcomes:**

Upon completion of this course students should be able to

1. Prepare document in order to organize competition.
2. Apply knowledge gained by managing competition.
3. Participate and evaluate the benefits of participating in lecture or practical class related to sport, recreation and leisure.

## **MPU2482 PERSONAL FINANCIAL MANAGEMENT 1**

**Prerequisite: Nil**

**Rationale for inclusion of the course in the program:**

This course is to educate students on personal financial education. It is to open their minds to things that they should be prepared for financially when they enter the competitive job market. The course explains what they should start doing early in their life to achieve their financial dreams.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply the concept of financial planning, building financial wealth and avoiding financial troubles.
2. Plan and execute financial planning events at campus level.
3. Describe the program implementation.

# **UNIVERSITY COMPULSORY COURSES (UCS)**

## **DIPLOMA**

**WQD10103 TECHNICAL MATHEMATICS 1**  
**WQD10203 TECHNICAL MATHEMATICS 2**  
**CLD21102 TECHNICAL MATHEMATICS 3**

**WED 10402 COMPETENCY ENGLISH**  
**WED 20202 COMMUNICATION ENGLISH 1**  
**WED 20302 COMMUNICATION ENGLISH 2**

**WMD10101 MANDARIN 1**  
**WMD10201 MANDARIN 2**

**WGD 1003 INTERPERSONAL SKILLS**

**WQD10103 TECHNICAL MATHEMATICS 1**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course is aimed to enhance the concept and provide the knowledge of solving indices and logarithms, to provide a solid foundation in algebra and to enrich the students with the knowledge of trigonometry and complex numbers. These concepts are essential since this is the foundation for their study in higher level of mathematics.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Solve operations and problems related to algebra.
2. Apply trigonometric functions in solving triangular problems.
3. Solve complex number operations in several forms.

**WQD10203 TECHNICAL MATHEMATICS 2**

**Prerequisite:** WQD10103 TECHNICAL MATHEMATICS 1

**Rationale for inclusion of the course in the program:**

This course is aimed at providing fundamental concepts of calculus. The students will be exposed to the theories and applications of trigonometry, functions, limits, differentiation and integration. These are essential since the students will encounter the components in science and engineering technology problems.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply the theories and concepts of trigonometry.
2. Solve operations of functions.
3. Apply differentiation and integration techniques to solve related practical problems.

**CLD 21103 TECHNICAL MATHEMATICS 3****Prerequisite:** WQD10103 TECHNICAL MATHEMATICS 2**Rationale for inclusion of the course in the program:**

This course is aimed at introducing students to differential equations, basic language of statistics and to apply statistical concepts in engineering. Students will be exposed to selecting, computing and interpreting basic statistical tools.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Classify and apply differential equation techniques to solve related practical problems.
2. Illustrate and explain a descriptive and inferential statistics for interpreting results.
3. Apply the concepts and rules for probability and properties of probability distribution.
4. Compute and interpret simple linear regression model and correlation coefficient.

**WED 10402 COMPETENCY ENGLISH****Prerequisite:** None**Rationale for inclusion of the course in the program:**

This course is designed primarily to enable students to apply a wide range of language skills (listening, speaking, reading and writing) and to apply appropriate grammatical rules in structured and non-structured situations as well as to develop self-confidence to use English effectively.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply appropriate language skills when communicating verbally and in written form
2. Listen and extract information from various audio
3. Speak effectively using appropriate language skills through discussion and presentation
4. Analyse linear and non-linear comprehension texts using appropriate reading skills
5. Write essays by applying appropriate writing skills and grammar

**WED 20202 COMMUNICATION ENGLISH 1**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This module is to enhance students' acquisition of English through language enrichment activities. The module enables students to enhance their English language proficiency through written work and oral communication. Students also engage in exploring and responding to ideas through meetings and conducting a languages activity. Student will then be exposed to the fundamentals of presentation skills.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply grammatical components correctly.
2. Write business correspondence.
3. Organise a project through conducting meeting, writing and presenting a proposal and executing the event.

**WED 20302 COMMUNICATION ENGLISH 2**

**Prerequisite:** WED 20202 Communication English 1

**Rationale for inclusion of the course in the program:**

This module is aim at enabling students to master important skills in writing a variety of technical reports. It also equips students with the skills to handle interview questions as well as write cover letter and resume. These skills are crucial in preparing students to function effectively in future workplace situations.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply appropriate mechanics in writing.
2. Produce and present a report.
3. Apply job hunting skills by preparing cover letter and resume and respond effectively during interview.



### **WMD10101 MANDARIN 1**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

Having a basic command of Mandarin will enhance learners' communication ability which enables them to have an extra edge in the job market. Thus, the objective of the course is to introduce basic Chinese with emphasis on conversations, which enable the learner to exchange conversations in structured sentences.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Use Mandarin in simple conversation, express feeling and emotions as well as exchange opinions.
2. Write basic Chinese characters.

### **WMD10201 MANDARIN 2**

**Prerequisite:** WMD10101 Mandarin 1

#### **Rationale for inclusion of the course in the program:**

Having a basic command of Mandarin will enhance learners' communication ability which enables them to have an extra edge in the job market. Thus, the objective of the course is to introduce basic Chinese with emphasis on conversations, which enable the learner to exchange conversations in structured sentences using slightly difficult vocabularies.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Use Mandarin in simple conversation, express feeling and emotions as well as exchange opinions.
2. Write basic Chinese characters.

## **WGD10103 INTERPERSONAL SKILLS**

**Prerequisite:** Noe

### **Rationale for inclusion of the course in the program:**

This course aims to inculcate students with positive habits that could be developed through positive thinking. This course also helps students to gain confidence in communication and function effectively as a team members or a leader. Students will be exposed to problem solving and decision making skills. In general the objectives of this course are to help build students with positive characteristics and shape them into becoming future leaders.

### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the principles and the intrapersonal and interpersonal skills.
2. Communicate effectively using various communication media.
3. Demonstrate leadership and teamwork skills.

## **MAJOR FOUNDATION COURSES**

### **DIPLOMA**

**CLD10004 GENERAL CHEMISTRY**  
**CLD10102 ENGINEERING GRAPHIC**  
**CLD10202 COMPUTING**  
**CLD10302 ORGANIC CHEMISTRY**  
**CLD10502 PRINCIPLES OF CHEMICAL PROCESS**  
**CLD10603 FLUID MECHANICS**  
**CLD20002 OCCUPATIONAL SAFETY AND HEALTH**  
**CLD20102 ELECTRICAL TECHNOLOGY**  
**CLD20202 PROCESS INSTRUMENTATION**  
**CLD20302 THERMODYNAMICS**  
**CLD20402 TRANSPORT PROCESS**  
**CLD20502 BASIC ENGINEERING WORKSHOP**  
**CKD20002 REACTOR TECHNOLOGY**  
**CKD20103 SEPARATION TECHNOLOGY**

**WPD39806 FINAL YEAR PROJECT**  
**WID39908 INDUSTRIAL TRAINING**

**CLD10004 GENERAL CHEMISTRY****Prerequisite: None****Rationale for inclusion of the course in the program:**

General Chemistry provides fundamental knowledge in chemistry. This course will equip students with essential knowledge that will enable them to be used and applied in chemical engineering technology and any related application. Students will also be exposed to basic laboratory skills including tools, chemicals, techniques and safety awareness.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Identify and solve problems related to basic principles of chemistry.
2. Describe properties of atoms and apply mole concepts such as chemical reactions, solution chemistry, acid and base, electrochemistry and gaseous state.
3. Demonstrate the correct and proper way of handling chemicals and apparatus with the application of mole concepts theory during laboratory session.

**CLD10102 ENGINEERING GRAPHIC****Prerequisite: None****Rationale for inclusion of the course in the program:**

This course provides fundamental background in engineering drawing to the students which will enable them to work more effectively in the various fields of engineering.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Identify the basic terminology and symbols used in engineering drawing.
2. Construct and demonstrate the basic engineering drawing technique of orthographic and isometric projection.
3. Draw and utilize computer-aided design (CAD) software to create technical drawings required for chemical and process engineering.

**CLD10202 COMPUTING****Prerequisite: None****Rationale for inclusion of the course in the program:**

This is an introductory course aimed at providing students with the basic concepts of computer system (hardware and software). These concepts and knowledge are essential since the students will use this end user software as a tool in their studies and working life

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Demonstrate theoretical knowledge of computer hardware and software.
2. Choose the most suitable computer hardware and software to solve computing task during their studies and working life.
3. Use application software such as: e-mail, web browser, MS Word, MS Excel, MS Access and MS PowerPoint.

**CLD10302 ORGANIC CHEMISTRY****Prerequisite: CLD10004 GENERAL CHEMISTRY****Rationale for inclusion of the course in the program:**

This is an introductory course aimed at providing students in understanding the theory of organic chemistry which forms the foundation of their study in later years. This knowledge is essential since students will use this information in the application of chemical engineering technology.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Describe different functional group of organic compound, based on group, reactions and usage.  
Perform laboratory works related to reaction of organic compound.
2. Demonstrate ability to work in team.

**CLD10502 PRINCIPLES OF CHEMICAL PROCESS**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This is an introductory course aimed at providing students with the fundamental concepts of chemical process which form the foundation for their study in later years. These concepts are essential in preparing students to formulate and solve material and energy balances on chemical process systems.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Determine the dimension of an equation and convert units from one unit to another.
2. Identify known information about process variables on individual process units and multiple-unit processes.
3. Solve material balances and energy balances to account for the flows to and from the process and its units

**CLD10603 FLUID MECHANICS**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course is an introduction to fluid mechanics and emphasizes fundamental concepts and problem solving techniques. Topics to be covered include fluid properties, pressure, fluid static's, control volume analysis and internal flow (flow in pipes and conduits). Students will be familiarized with the equipment involved in fluid flow. The student will also be able to evaluate basic concepts in selecting and analyzing components of fluid systems

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the properties of fluids, types of pumps and compressor with their operating principles.
2. Relate the concepts of static and dynamic fluid in its application based on mass and energy conservation to the analysis of fluid systems.
3. Demonstrate the ability to conduct experiments related to fluid flow by following standard operating procedure and safety awareness

## **CLD20002 OCCUPATIONAL SAFETY AND HEALTH**

**Prerequisite:** None

### **Rationale for inclusion of the course in the program:**

This course will impart knowledge and create an awareness to occupational safety and health. Students will be exposed to the design, techniques, legal, society and cultural issues in making the work place as safe as possible.

### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Demonstrate the ability to recognize type of hazards related to occupational safety and health, determine an appropriate control measures and evaluate the risks associate with it.
2. Collaborate with team members in discussing current issues in occupational safety and health.
3. Analyze the safety and health issues at workplace by comparing to Malaysian laws and regulations.

## **CLD20102 ELECTRICAL TECHNOLOGY**

**Prerequisite:** None

### **Rationale for inclusion of the course in the program:**

This is an introductory course aimed at providing students with the fundamentals concept and knowledge of electrical technology. This course will provide students with skills and understanding to operate electrical tools and machines safely and effectively.

### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Describe basic principles of electricity, circuit theorems, electrical system, and electrical machines.
2. Relate experiments and project according to the standard operating procedure given.
3. Describe basic principles and practices from electrical fundamental disciplines to solve electrical problems.

**CLD20202 PROCESS INSTRUMENTATION**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course will impart knowledge and application of process instrumentation. Students will be exposed to the principle and application including the maintenance, troubleshooting and safety aspects of process instrumentation.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the working principle, maintenance and troubleshooting procedures of the measurement devices.
2. Relate the application of instruments in the real plant/factory.
3. Demonstrate the ability to conduct the experiment by following standard operating procedure and safety awareness.

**CLD20302 THERMODYNAMICS**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This is an introductory course aimed at providing students with the fundamental concepts in thermodynamics. These concepts are essential since the students will apply this knowledge in other engineering courses.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Locate the thermal and volumetric properties of pure substances from the properties tables (C2).
2. Describe the application of thermodynamics law (C2, P1)
3. Analyse the closed system and open system in the First Law of Thermodynamics



### **CLD20402 TRANSPORT PROCESS**

**Prerequisite:** CLD10502 Principles Of Chemical Process

#### **Rationale for inclusion of the course in the program:**

This course will provide students with the knowledge of heat and mass transfer which will be useful for their study in later years.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Differentiate the three modes of heat transfer.
2. Perform laboratory works safely according to the related operating manual.
3. Perform basic calculation in solving problems related to heat transfer.

### **CLD20502 BASIC ENGINEERING WORKSHOP**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

This is an introductory course aimed at providing students with the basic mechanical engineering workshop practice. Students will be familiarized with basic principles and practical of hand tools in basic engineering workshop. The student also will be able to perform basic machining operation and basic welding operation

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Choose a suitable tools and equipments in metal fabrication, machining and welding activities.
2. Describe and report activities involve with metal fabrication, machining and welding process.
3. Develop and collaborate an interaction between group members in workshop activities.

**CKD20002 REACTOR TECHNOLOGY**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course will impart knowledge of chemical reaction. Students will be exposed to chemical kinetics, different reactor operations, catalysis and catalytic reaction.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Describe the concept of chemical kinetics and the importance of catalyst on different types of reactor.
2. Apply the concept of chemical kinetics and operating principles of various reactors in experimental works.
3. Solve problems related to chemical reaction and reactor design based on the concept of chemical kinetics.

**CKD20103 SEPARATION TECHNOLOGY**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course will provide students with the basic principle and operations of separation in chemical engineering technology and expose students to separation technology equipments.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Acquire the basic knowledge concerning Homogeneous and Heterogeneous mixtures and also fundamental knowledge for each method under Chemical and Mechanical Separation.
2. Apply the knowledge of Homogeneous and Heterogeneous mixture as well as fundamental knowledge of Chemical and Mechanical Separation when conducting laboratory experiments.
3. React and Respond to any problems or issues related to mixtures that are to be separated or purified as well as technology and methods related to Separation Processes.
4. Solve scientific problems in terms of analyzing and interpreting data for all the performed experiments of Separation methods.

### **WPD39806 FINAL YEAR PROJECT**

**Prerequisite:** Subject to programme requirement.

#### **Rationale for inclusion of the course in the program:**

This course introduce students with ability and skills in conducting the technical project based on their specialization area. It provide students with technical writing and presentation skills.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Plan the project activities to fulfil the purpose research problem.
2. Manage and execute the project plan to accomplish the project objectives.
3. Analysed project result using appropriate technique or tools.
4. Produce a project report in accordance with the specified standard format.
5. Present and defend the project outcomes affectively.

### **WD39908 INDUSTRIAL TRAINING**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

This course is aimed to exposing students to real industrial environment and the opportunity to practice the knowledge and skills acquired during their academic years.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Practice the right work attitude with deliberation on safety and health in a real life working environment.
2. Perform task with minimum supervision and meet company expectation.
3. Apply analytical and problem solving skills in accomplished task assign by the company.
4. Explain knowledge and skills acquired during the attachment.
5. Present work experience learnt orally and in writing effectively.

## **MAJOR COURSES**

# **DIPLOMA**

### **Diploma in Chemical Engineering Technology (Process)**

- CPD20002 Plant, Utilities and Safety**
- CPD20103 Petrochemicals and Petroleum Refining  
Technology**
- CPD20202 Environmental Control and Management**
- CPD20402 Pilot Plant 1**
- CPD20302 Process Control**
- CPD30002 Quality Assurance and Quality Control**
- CPD30103 Plant Maintenance and Inspection**
- CPD30302 Pilot Plant Operation 2**

### **CPD20002 PLANT, UTILITIES AND SAFETY**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

To give understanding on the supporting facilities, this is connected to the major processing equipment in the plant.

**Learning Outcomes:**

Upon completion of this course students should be able to

1. Describe the function of various equipment utility and basic trouble shooting plant utilities with methods to solve the problems.
2. Discuss the basic principles, operation, advantages and disadvantages of respective equipment, fundamental operation of every each plant equipment to the current technology and basic safety practice for the various plant utility.
3. Work in teams and communicate effectively in presenting industrial case study.

### **CPD20103 PETROCHEMICALS AND PETROLEUM REFINING TECHNOLOGY**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course is aimed at providing students with the fundamentals of petroleum refining, petrochemical technology and natural gas processing technology.

**Learning Outcomes:**

Upon completion of this course students should be able to

1. Distinguished the processes involved in petroleum refining, natural gas and petrochemical (C4).
2. Perform analysis of petroleum product and natural gas by following standard applied (P3).
3. Solve the problems involve in petroleum refining, natural gas and petrochemical synthesis

## **CPD20202 ENVIRONMENTAL CONTROL AND MANAGEMENT**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course will provide students with the knowledge in environmental control and management of pollution. These include basic principles in managing and assessment of pollution, basic water quality testing and the relevant regulations in environment protection in Malaysia.

**Learning Outcomes:**

Upon completion of this course students should be able to

1. Describe the environmental terminology and the relevant regulations of environmental protection in Malaysia.
2. Analyze the assessment and control methods in air pollution, noise pollution and waste water.
3. Discuss the roles of chemical engineering technologist in the environmental management.

## **CPD20402 PILOT PLANT 1**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

The course is aimed at providing students with the basic practical knowledge in chemical process operations such as petrochemical and oleo-chemical processing.

**Learning Outcomes:**

Upon completion of this course students should be able to

1. Classify the various processing methods in the production of petrochemical and oleo-chemical products.
2. Discuss the current application of petrochemical and oleo-chemical products.
3. Collaborate with team members in planning and discussing the current application of petrochemical and oleo-chemical products.

### **CPD20302 PROCESS CONTROL**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course will provide students with the knowledge in the various aspects of process control and its applications in the chemical industries. These concepts are essential since the students will apply the knowledge gained in process control related application.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Employ the main components in control system to chemical process flow diagram.
2. Distinguish the different control strategies for various chemical process applications
3. Interpret results, graphs and data obtained from practical session.

### **CPD30002 QUALITY ASSURANCE AND QUALITY CONTROL**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course is aim to provide students with the concept of controlling chemical process and products via quality control and statistical techniques.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Identify appropriate statistical methods to solve statistical problems.
2. Construct appropriate control charts in solving related problems.
3. Solve their lesson on statistical software to analyze data.

### **CPD30103 PLANT MAINTENANCE AND INSPECTION**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course is to provide fundamental knowledge in plant maintenance and inspection. It also introduces students to the importance of maintenance strategy and principles.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain basic plant management, plant maintenance and inspection in a plant process.
2. Distinguish between maintenance work, repair work, commissioning, shutdown and start up maintenance.
3. Apply the various maintenance strategies in a plant maintenance.

### **CPD30302 PILOT PLANT OPERATION 2**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course is aimed at providing students with the basic practical knowledge in plant utility operations and selected testing. The course also introduces students with equipment involved in plant utilities and selected testing. This practical knowledge is essential since the students will encounter these in their future engineering career.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Classify the application of thermodynamics in chemical engineering technology.
2. Demonstrate ability to work in team either as a leader or member.
3. Organize a technical project on application knowledge of thermodynamics, heat transfer and fluid mechanics.



## **MAJOR COURSES**

# **DIPLOMA**

### **Diploma in Chemical Engineering Technology (Food)**

**CFD20002 Quality Assurance and Quality Control in Food Industries**

**CFD20103 Food Processing Technology**

**CFD20203 Food Microbiology**

**CFD20302 Food Chemistry**

**CFD30003 Food Analysis**

**CFD30103 Food Packaging**

**CFD30202 Food Sanitation and Legislation**

**CFD30303 Sensory Evaluation of Food**

### **CFD20002 Quality Assurance and Quality Control in Food Industries**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

To provide students with knowledge of the importance of quality assurance and quality control in food industries, basic quality problems of food products, and knowledge of various quality management system that commonly applied in food industries.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Identify and describe the principles, practices and basic quality problems of food products in food industry.
2. Analyze and select the suitable monitoring and control of a process to ensure that it operates at its full potential to produce conforming product based from statistical methods.
3. Discuss the key issues in food legislation in Malaysia and internationally and its implementation in control and management of food quality and safety

### **CFD20103 Food Processing Technology**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

To impart knowledge and technical skills in processing and preservation technology of various food products.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the principle of food processing and preservation techniques applied at low, ambient or high temperature and the effect of processing techniques towards food products/ingredient.
2. Demonstrate the working principle of food processing equipment/machinery and the ability of handling and troubleshooting of the equipment/machinery.
3. Collaborate with team members in planning, performing and reporting a scientific inquiry, practical or assignment related to food processing and preservation technology.

**CFD20203 Food Microbiology**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course aimed to provide the students with understanding of the basic function, activity, classification of microorganisms, microbiological quality of food products and food safety. The student will also obtain a good understanding of laboratory practices in food microbiology.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain and discuss the theories and concepts of microorganisms, factors that influence microbial growth, microorganisms in foods, food spoilage and food borne diseases.
2. Conduct, interpret and discuss results of analysis in food microbiology.
3. Collaborate with team members in planning and performing a scientific inquiry

**CFD20302 Food Chemistry**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course aimed to provide the students with understanding of the fundamental concept of chemical properties and reactions in food.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the structure, properties and functions of major food constituents such as water, carbohydrates, lipids, proteins, enzymes, vitamins, mineral, pigments and other food additives.
2. Collaborate with team members in planning and reporting a scientific inquiry/assignment related to food chemistry.
3. Give presentation to selected topics in food chemistry.

### **CFD30003 Food Analysis**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

This course will provide the principles of chemical and instrumental analysis of food and provide laboratory experience for students.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Applying the principles and procedure of chemical, physical and instrumental analysis for the purpose of laboratory analysis of food (C3).
2. Display the knowledge of the course in doing food sampling and food analysis (P4).
3. Collaborate with team members in planning, performing and reporting a scientific inquiry/assignment related to food analysis

### **CFD30103 Food Packaging**

**Prerequisite:** None

#### **Rationale for inclusion of the course in the program:**

To provide students with the principles of food packaging and application of packaging materials in food industry as well as packaging regulation and labelling requirement to be in line with Malaysian Food Act 1983 and Food Regulation 1985.

#### **Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the function of food packaging and the packaging materials used in food product application.
2. Explain the typical packaging materials testing and some major packaging equipment.
3. Collaborate with team members in reporting the experimental results/assignment given.

### **CFD30202 Food Sanitation and Legislation**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

This course aimed to provide students with knowledge on the principles and applications of food hygiene in food manufacturing, food laws and legislation and standards and guidelines in sanitation.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Explain the principles and applications of food hygiene in food manufacturing, food laws and legislation in sanitation.
2. Retrieve information on laws and regulations pertaining to food sanitation.
3. Give presentations in class on selected topics.

### **CFD30303 Sensory Evaluation of Food**

**Prerequisite:** None

**Rationale for inclusion of the course in the program:**

To provide students with the basic principles and requirements of sensory evaluation of food.

**Learning Outcomes:**

Upon completion of this course students should be able to:

1. Apply the appropriate techniques and methods of sensory evaluation for product development.
2. Conduct and report results of experiment by using appropriate statistical methods to guide product development and assure quality of food.
3. Discuss with team members in planning and performing sensory test as a project.