



XIAMEN UNIVERSITY MALAYSIA

廈門大學 馬來西亞分校

PROGRAMME HANDBOOK

BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS

ACADEMIC SESSION: 2026/09



Academic Affairs Office

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1. UNIVERSITY VISION AND MISSION

Vision

- Xiamen University Malaysia aspires to become a university with a distinct global outlook, featuring first-class teaching and research, and embracing cultural diversity.

Mission

- To nurture young talents with dignity and wisdom, turning them into fine citizens of the region who will contribute to the prosperity of the people and social progress of Malaysia, China and Southeast Asia.

2. PROGRAMME AIMS

The programme at XMU is designed to produce chemical engineering professionals who possess knowledge, skills and appropriate attitudes in the area of chemical engineering and technology which encompass core science engineering knowledge, a wide range of soft skills including communication, analytical and problem solving, teamwork, engineering economics and management skills.

3. PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The PEOs are to produce graduates who are:

PEO1

Demonstrate professionalism & social responsibility in the practice of chemical and allied engineering.

PEO2

Display leaderships and assume technical or managerial positions of greater responsibility in multicultural working environment.

PEO3

Pursue continued life-long learning through professional practice and further graduate education.

4. PROGRAMME LEARNING OUTCOMES (PLO)

At the end of the programme, graduates will be able to:

PLO1

Engineering Knowledge

Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization to develop solutions to complex engineering problems.

PLO2

Problem Analysis

Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development.

PLO3

Design/ Development of Solutions

Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required.

PLO4

Investigation

Conduct investigation of complex engineering problems using research methods including research-based knowledge, including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PLO5

Modern Tool Usage

Create, select and apply, and recognize limitation of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems.

PLO6

The Engineer and Society

Analyze and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems.

PLO7

Environment and Sustainability

Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion.

PLO8

Ethics

Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multidisciplinary, face-to-face, remote and distributed settings.

PLO9 Communication

Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences.

PLO10 Individual and Team Work

Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects in multidisciplinary environments.

PLO11 Life Long Learning

Recognise the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

5. EXPECTED AREAS OF GRADUATE EMPLOYMENT

Process and product design, management and consultancy in the oil, petrochemical and other chemical and process industries, manufacturing of pharmaceuticals, biomass-based chemicals, fine chemicals and speciality chemicals; design and manufacture of chemical plants in industries dealing with gas supply, food and beverage, pharmaceuticals, nuclear energy, water, mining and minerals, wastewater treatment, electronics, and etc.

6. CURRICULUM STRUCTURE

The minimum requirement for graduation will be **145** credits, with all the components meeting the minimum credit values specified in Table 1.

Table 1: Components of the Programme and its Value

	Course Classification	Credit Value	Percentage (%)
1	Compulsory Courses/Modules		
	• MQA Compulsory	12	8.3%
	• University Compulsory (General Elective)	12	8.3%
2	Core/Major(s)/Specialisation:		
	• Major Core	93	64.1%
	• Projects	12	8.3%
3	Optional/elective courses:		
	• Major Elective	12	8.3%
4	Industrial Training	4	2.8%
	Total Credit Value	145	100.0%

Compulsory Courses

Compulsory Courses refer to *Mata Pelajaran Pengajian Umum (MPU)*, or General Studies, which is a compulsory component of undergraduate education in Malaysia as mandated by the Ministry of Higher Education (MoHE), as shown in Table 2a below.

MPU aims to develop well-rounded graduates by complementing academic studies with broader knowledge, essential skills, ethical values, and social responsibility. Through courses that promote critical thinking, effective communication, integrity, and community engagement, MPU prepares students to become responsible citizens and lifelong learners in an increasingly interconnected world.

Table 2a: Components of the **Compulsory** Courses and its Value

No.	Name of Course	Course Code	Credit Value	International	Malaysian
U1 (3 courses @ 2 credits per course) Philosophy, Values & History Appreciation					
1	Bahasa Melayu Komunikasi 2	MPU1012	2	√	-
2	Integriti dan Antirasuah (Integrity and Anti-Corruption)	MPU1022	2	√	√
3	Aspirasi Negara Bangsa (Malaysian Nation-State Aspiration)	MPU1032	2	-	√
4	Falsafah dan Cabaran Semasa	MPU1042	2	-	√
5	Citra Malaysia (Malaysian Citra)	MPU1052	2	√	-
U2 (1 course @ 2 credits) Soft Skills					
6	Bahasa Kebangsaan A	MPU2012	2	-	1. Fail Bahasa Melayu SPM OR 2. Scored below C/ without credit in Bahasa Melayu SPM
7	Writing for Professional Purposes	MPU2022	2	√	1. Malaysian students with a credit in BM at SPM OR 2. Took and Passed Bahasa Kebangsaan A in diploma level MUST take Writing for Professional Purposes.
U3 (1 course @ 2 credits) Knowledge About Malaysia					
8	Artificial Intelligence and Malaysia's Digital Economy	MPU3012	2	√	√
U4 (1 course @ 2 credits) Practical Course (Community Service, Motivational, Co-curriculum)					
9	Community Service	MPU4012	2	√	√
Total Credit Value (Compulsory Courses)			12		

General Elective Courses

General Elective Courses refer to courses designed to give students options beyond their major-related courses in order to diversify their scope of knowledge.

Students in the Science field can choose courses they are interested in from Group I (Arts), Group II (Business), and Group IV (Artificial Intelligence) as shown in Table 2b. Students in Chemical Engineering shall achieve at least a total of 12 credits, with each group meets the minimum requirement of 1 course.

Table 2b: Components of the General Elective Courses and its Value

No.	Name of Course	Course Code	Credit Value	Remarks
Group I (Arts)				
1	Group I comprises general elective courses in the field of Arts such as <i>Art Appreciation, Basic Korean Language, and Communication Skills for Job Search.</i>	G01XX/ G11XX		Minimum 1 course
Group II (Business)				
2	Group II comprises general elective courses in the field of Business such as <i>Introduction to Finance, Entrepreneurship and Sustainable Development, and Introduction to International Business..</i>	G02XX		Minimum 1 course
Group IV (Artificial Intelligence)				
3	Group IV comprises general elective courses in the field of Artificial Intelligence, comprising: • Discipline-based (Compulsory) • General (Optional)	G04xx		Minimum 1 course
Total Credit Value (General Elective Courses)			12	

*Note: The courses listed are provided as examples for reference only. The actual general elective courses offered may vary each semester. Students should refer to the **General Elective Course Library** for the list of general elective courses available in a particular semester.*

Major Core Courses

Major Core Courses refer to courses designed to meet the core educational objectives; each major has its own features.

Table 2c: Components of the **Major Core** Courses and its Value

No.	Name of Course	Course Code	Credit Value
1	Engineering Mathematics I	BSC112	3
2	Engineering Mathematics II	BSC113	3
3	Numerical Methods in Engineering	BSC208	4
4	Engineers in Society	BSC401	3
5	Chemical Engineering Drawing	CME103	3
6	Introduction to Chemical Engineering	CME110	3
7	Analytical Chemistry for Engineers	CME111	3
8	Introduction to Biochemical Engineering	CME112	3
9	Chemical Engineering Thermodynamics I	CME113	3
10	Physical Chemistry	CME114	3
11	Organic Chemistry	CME115	3
12	Chemical Laboratory for Engineers	CME116	1
13	Unit Operations of Chemical Engineering I	CME208	3
14	Fluid Mechanics for Chemical Engineering	CME211	3
15	Chemical Engineering Thermodynamics II	CME212	3
16	Reaction Engineering	CME213	3
17	Unit Operations of Chemical Engineering II	CME214	3
18	Chemical Process Safety	CME215	3
19	Heat Transfer	CME221	3
20	Mass Transfer	CME222	3
21	Materials Science for Chemical Engineering	CME223	3
22	Chemical Engineering Laboratory I	CME224	2
23	Chemical Engineering Laboratory II	CME225	2
24	Modelling and Simulation of Chemical Processes	CME317	3

25	Process Control and Instrumentation	CME329	4
26	Chemical Engineering Laboratory III	CME330	2
27	Plant Equipment Design	CME331	3
28	Engineering Statistics and Optimisation	CME332	3
29	Sustainable Development in Chemical Engineering	CME333	3
30	Environmental Engineering and Management	CME334	3
31	Machine Learning for Chemical Engineers	CME335	3
32	Project Management and Economics	CME429	3
Total Credit Value (Major Core Courses)			93

Table 2d: Components of the **Projects** and its Value

No.	Name of Course	Course Code	Credit Value
1	Research Project I	CME438	3
2	Research Project II	CME439	3
3	Capstone Project I	CME440	3
4	Capstone Project II	CME441	3
Total Credit Value (Industrial Training)			12

Table 2e: Components of the **Industrial Training** and its Value

No.	Name of Course	Course Code	Credit Value
1	Industrial Training	CME327	4
Total Credit Value (Industrial Training)			4

Major Elective Courses

Major Elective Courses refer to courses designed to help students to identify their interested field or direction within the major, which enable them to be better prepared for their careers pathways.

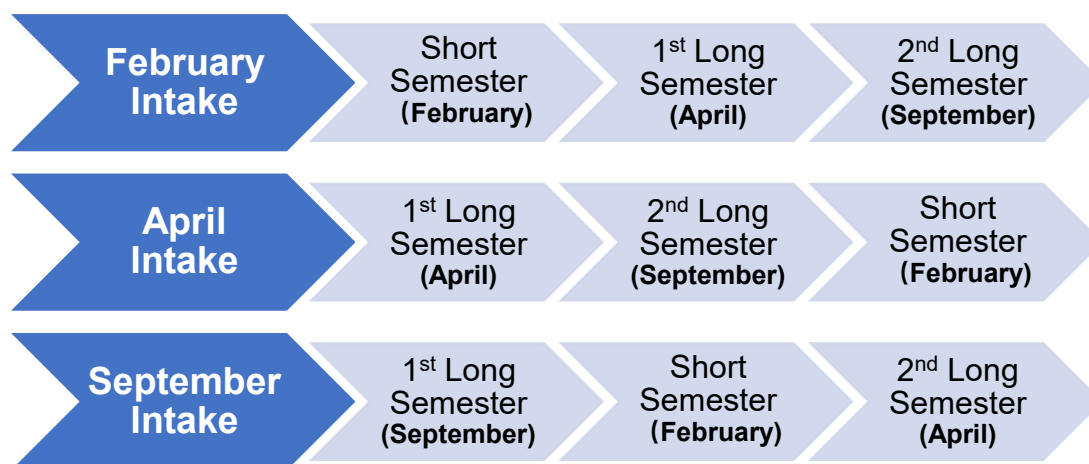
For major elective courses, students are required to choose designated courses based on table below:

Table 2f: Components of the **Major Elective** Courses and its Value

No.	Name of Course	Course Code	Credit Value	Remarks
Industrial Revolution 5.0 & AI	System Optimisation	CME433	3	Students to choose four (4) elective courses
	Computational Fluid Dynamics	CME434	3	
	Multi-Scale Modelling and Simulation	CME435	3	
	Applied Additive Manufacturing for Chemical Engineers	CME449	3	
	Machine Learning for Chemical Engineers	CME450	3	
	Digital Twin Design for Smart Agri-Aquaculture with GIS-CFD	CME453	3	
	Smart Process Systems Engineering	CME454	3	
Engineering Technology	Membrane Technology	CME436	3	
	Oils and Fats Technology	CME443	3	
	Catalysis Technology	CME445	3	
	Particle Technology	CME446	3	
Green and Sustainable	Nanomaterials	CME437	3	
	Circular Economy and Sustainability	CME451	3	
	Emerging Bioprocess Engineering	CME452	3	
	Sustainable Decarbonization Systems	CME455	3	
	Sustainable Electrochemical Engineering	CME456	3	
	Thermal Energy Management for Process Industries	CME457	3	
Chemical Engineering Process	Process Safety Management (PSM)	CME442	3	
	Simulation Integrated Process Plant	CME444	3	
	Crude Oil Refining Processes and Practices	CME447	3	
Total Credit Value (Major Elective Courses)			12	

7. LIST OF COURSES OFFERED FOR EACH ACADEMIC YEAR

There are three (3) semesters in each academic year: two (2) long semesters and one (1) short semester. The sequence of course registration varies according to the intake:



Students should be aware that the total number of credits shall not exceed **20** for long semester and **7** for a short semester.

It is important to note that the arrangement of courses for each academic year listed below is subject to change based on programme needs or institutional requirements.

Year	Semester	Course Name	Course Code	Classification	Credit
Year 1	1 st Long Semester	Chemical Engineering Drawing	CME103	Core	3
		Introduction to Chemical Engineering	CME110	Core	3
		Analytical Chemistry for Engineers	CME111	Core	3
		Physical Chemistry	CME114	Core	3
		Engineering Mathematics I	BSC112	Core	3
		Bahasa Melayu Komunikasi 2	MPU1012	MQA Compulsory	2
		Aspirasi Negara Bangsa (Malaysian Nation-State Aspiration)	MPU1032	MQA Compulsory	
		Total Credit Value			
	2 nd Long Semester	Introduction to Biochemical Engineering	CME112	Core	3
		Chemical Engineering Thermodynamics I	CME113	Core	3
		Organic Chemistry	CME115	Core	3
		Fluid Mechanics for Chemical Engineering	CME211	Core	3
		Engineering Mathematics II	BSC113	Core	3
		Chemical Laboratory for Engineers	CME116	Core	1
		Total Credit Value			
	Short Semester	General Elective Subject	Gxxxx	General Elective	2
		Integriti dan Antirasuah (Integrity and Anti-Corruption)	MPU1022	MQA Compulsory	2
		Falsafah dan Cabaran Semasa	MPU1042	MQA Compulsory	2
		Citra Malaysia (Malaysian Citra)	MPU1052	MQA Compulsory	
		Total Credit Value			
Year 2	1 st Long Semester	Numerical Methods in Engineering	BSC208	Core	4
		Chemical Engineering Thermodynamics II	CME212	Core	3
		Heat Transfer	CME221	Core	3
		Materials Science for Chemical Engineering	CME223	Core	3
		Chemical Engineering Laboratory I	CME224	Core	2
		Total Credit Value			
	2 nd Long Semester	Unit Operations of Chemical Engineering I	CME208	Core	3
		Reaction Engineering	CME213	Core	3
		Mass Transfer	CME222	Core	3
		Engineering Statistics and Optimisation	CME332	Core	3
		General Elective Subject (Group IV Discipline-based)	G04xx	General Elective	2
		Bahasa Kebangsaan A	MPU2012	MQA Compulsory	2
		Writing for Professional Purposes	MPU2022	MQA Compulsory	
		Total Credit Value			

Year	Semester	Course Name	Course Code	Classification	Credit
	Short Semester	General Elective Subject	Gxxxx	General Elective	6
		Total Credit Value			
Year 3	1 st Long Semester	Unit Operations of Chemical Engineering II	CME214	Core	3
		Chemical Process Safety	CME215	Core	3
		Chemical Engineering Laboratory II	CME225	Core	2
		Process Control and Instrumentation	CME329	Core	4
		Sustainable Development in Chemical Engineering	CME333	Core	3
		Total Credit Value			
	2 nd Long Semester	Modelling and Simulation of Chemical Processes	CME317	Core	3
		Chemical Engineering Laboratory III	CME330	Core	2
		Plant Equipment Design	CME331	Core	3
		Environmental Engineering and Management	CME334	Core	3
		Machine Learning for Chemical Engineers	CME335	Core	3
		Project Management and Economics	CME429	Core	3
	Total Credit Value				17
	Short Semester	Industrial Training	CME327	Core	4
		Total Credit Value			
Year 4	1 st Long Semester	Research Project I	CME438	Core	3
		Capstone Project I	CME440	Core	3
		Engineers in Society	BSC401	Core	3
		Elective*	CMEXXX	Elective	3
		Elective*	CMEXXX	Elective	3
		Total Credit Value			
	2 nd Long Semester	Research Project II	CME439	Core	3
		Capstone Project II	CME441	Core	3
		Elective*	CMEXXX	Elective	3
		Elective*	CMEXXX	Elective	3
		Total Credit Value			
	Short Semester	General Elective Subject	Gxxxx	General Elective	2
		Artificial Intelligence and Malaysia's Digital Economy	MPU3012	MQA Compulsory	2
		Community Service	MPU4012	MQA Compulsory	2
		Total Credit Value			
Grand Total					145

8. PREREQUISITE COURSES

A prerequisite is a course that must be completed before taking a more advanced course.

Course Code	Course Name	Prerequisites
BSC113	Engineering Mathematics II	BSC112 Engineering Mathematics I
BSC208	Numerical Methods in Engineering	BSC113 Engineering Mathematics II
CME212	Chemical Engineering Thermodynamics II	CME113 Chemical Engineering Thermodynamics I
CME214	Unit Operations of Chemical Engineering II	CME208 Unit Operations of Chemical Engineering I
CME221	Heat Transfer	CME110 Introduction to Chemical Engineering
CME222	Mass Transfer	CME110 Introduction to Chemical Engineering
CME327	Industrial Training	CME215 Chemical Process Safety
CME333	Sustainable Design in Chemical Engineering	CME213 Reaction Engineering
CME335	Machine Learning for Chemical Engineers	BSC208 Numerical Methods in Engineering
CME434	Computational Fluid Dynamics	CME211 Fluid Mechanics for Chemical Engineering
CME439	Research Project II	CME438 Research Project I
CME440	Capstone Project I	CME110 Introduction to Chemical Engineering
		CME329 Process Control and Instrumentation
		CME331 Plant Equipment Design
CME441	Capstone Project II	CME440 Capstone Project I
CME442	Process Safety Management (PSM)	CME215 Chemical Process Safety
CME452	Emerging Bioprocess Engineering	CME112 Introduction to Biochemical Engineering
CME454	Smart Process Systems Engineering	BSC208 Numerical Methods in Engineering

9. IMPORTANT NOTE

Threshold Requirement

A grade threshold refers to the minimum number of marks that a student needs to obtain in a particular component of the course.

Chemical Engineering students must obtain a threshold mark of 40 in the final examination and achieve an overall mark of 55 or above to pass a core / major / elective course.

Note: The above information is subject to change as new information becomes available in accordance with the guiding standards and requirements set by relevant authorities.