



XIAMEN UNIVERSITY MALAYSIA

廈門大學 馬來西亞分校

PROGRAMME HANDBOOK

BACHELOR OF ENGINEERING IN NEW ENERGY SCIENCE AND ENGINEERING (HONOURS)

ACADEMIC SESSION: 2026/09



Academic Affairs Office

Contents

1. UNIVERSITY VISION AND MISSION.....	3
2. PROGRAMME AIMS	3
3. PROGRAMME EDUCATIONAL OBJECTIVES (PEO).....	3
4. PROGRAMME LEARNING OUTCOMES (PLO).....	4
5. EXPECTED AREAS OF GRADUATE EMPLOYMENT	5
6. CURRICULUM STRUCTURE	6
7. LIST OF COURSES OFFERED FOR EACH ACADEMIC YEAR.....	12
8. PREREQUISITE COURSES	15
9. IMPORTANT NOTE	16

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 aims of the Bachelor of Engineering in New Energy Science and Engineering (Honours) programme are to develop highly flexible professionals with a comprehensive speciality foundation, who are both employable-ready for the demands in energy and related industries, or committed to the furtherance of scholastic endeavours in the same or related fields. It equips the students with core theories and practices for the analysis, modelling, evaluation, design, development, and implementation of energy technology. Students will also be developed to possess values and professionalism such as sincerity, commitment, innovation, healthy competition, responsibility, confidence, as well as be ingrained with a high level of skills in teamwork, leadership, lifelong learning and open communication.

3. PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The PEOs are to produce graduates who are:

PEO1

Demonstrate competence in knowledge of science, engineering and technological capabilities, applying systems thinking and critical thinking to provide strategic and integrated problem-solving for present and prospective problems related to energy domains.

PEO2

Deliver a myriad of soft skills to various stakeholders through collaboration and practice their professionalism with high regard to normative, societal benefits, ethical, and entrepreneurial possibilities in multicultural working environment

PEO3

Possess self-awareness and anticipatory competency in engaging lifelong learning, pursue postgraduate studies or participate in continual professional development.

4. PROGRAMME LEARNING OUTCOMES (PLO)

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

PLO1	Knowledge and Understanding	Present comprehensive theoretical and technical knowledge in science and engineering within energy domains.
PLO2	Cognitive Skills	Apply knowledge and critical, analytical and evaluation skills to solve problems in the energy related field.
PLO3	Practical Skills	Utilize practical skills to solve a broad range of complex problems in science and engineering.
PLO4	Interpersonal Skills	Perform collaborative works with various personnel in diverse learning and working environments locally and internationally.
PLO5	Communication Skills	Communicate effectively both in oral and writing to a diversity of audience.
PLO6	Digital Skills	Use appropriate information or digital technologies to perform study and support to the need of work in the field of specialization.
PLO7	Numeracy Skills	Perform numerical analysis or interpret data with graphical/visual aids for the purpose of study or accomplishment in the workplace.
PLO8	Leadership, Autonomy and Responsibility	Demonstrate characteristics of team leader/player in managing responsibilities, decision making capacities or accountabilities within organization.
PLO9	Personal Skills	Engage in self-directed lifelong learning and be prepared to continually build upon knowledge and acquired skills for professional development.
PLO10	Entrepreneurial Skills	Demonstrate entrepreneurial thinking skills and competency in a multidisciplinary environment.
PLO11	Ethics and Professionalism	Practice adherence and compliance to ethical, environmental and professional values to the contribution for sustainable development locally and internationally.

5. EXPECTED AREAS OF GRADUATE EMPLOYMENT

Graduates may pursue technical or research careers in the energy sector, including renewable energy generation, energy storage, energy materials development, and energy utilisation and management.

- **Energy Generation**

This category focuses on developing and managing systems to produce renewable and sustainable energy.

- **Clean Energy and Renewable Energy Industry**

Specialisation: Renewable energy engineer, solar energy specialist, hydrogen energy specialist & bioenergy/biofuel scientist, etc.

- **Energy Storage**

This category focuses on innovating storage solutions to enhance the reliability and scalability of renewable energy systems.

- **Energy Storage and Materials Development Industry**

Specialisation: Batteries, supercapacitors, hydrogen storage specialist, energy materials scientist/specialist, etc.

- **Energy Utilisation and Applications**

This category is focused on optimising energy use and developing systems to reduce waste and improve sustainability.

- **Energy Management and Semiconductor Industry**

Specialisation: Energy management expert, semiconductor power electronics specialist, artificial intelligence expert, carbon capture and storage (CCS) expert, energy industrial optimisation, 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		
	• Compulsory – Mata Pelajaran Wajib (MPU)	12	8.3%
	• Compulsory - University	6	4.1%
2	Core/Major(s)/Specialisation:		
	• Common Core	26	17.9%
	• Major Core	55	37.9%
	• Thesis	10	6.9%
	• Major Elective	18	12.4%
3	Optional/elective courses:		
	• General Elective	10	6.9%
4	Industrial training/Practicum	8	5.5%
	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

Compulsory – Mata Pelajaran Pengajian Umum (MPU)

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		

Compulsory – University

No.	Name of Course	Course Code	Credit Value
1	Principles of Management	G0206	2
2	Business Strategy	G0221	2
3	AI-Copiloted Coding for Engineering	G0412	2
Total Credit Value (Compulsory - University Courses)			6

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 New Energy Science and Engineering shall achieve at least a total of 10 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)				
	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)				
	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)				
	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)			10	

*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.*

Common Core Courses

Common Core Courses refer to essential courses offered for students from different majors but in the same discipline.

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

No.	Name of Course	Course Code	Credit Value
1	General Chemistry	BSC103	3
2	General Chemistry Laboratory	BSC104	2
3	Calculus I A	BSC121	5
4	Calculus II	BSC123	5
5	Linear Algebra	BSC124	3
6	Probability and Statistics B	BSC126	2
7	Python Programming Language	BSC135	3
8	Analytical Chemistry	BSC209	3
Total Credit Value (Common Core Courses)			26

Major Core Courses

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

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

No.	Name of Course	Course Code	Credit Value
1	General Physics Laboratory	BSC108	2
2	Fundamentals of Renewable Energy Engineering	EGE105	3
3	Energy Economics, Policy and Project Management	EGE106	3
4	General Physics	EGE107	4
5	Engineering Drawing	EGE206	3
6	Applied Chemistry	EGE207	3
7	Foundation of Materials Science	EGE208	3

8	Technology of Electrochemical Power Sources	EGE209	3
9	Electrical Principles	EGE210	3
10	Engineering Thermodynamics	EGE211	3
11	Engineering Fluid Mechanics	EGE212	3
12	Solar Energy Engineering	EGE325	3
13	Modeling and Simulation in Energy Engineering	EGE326	3
14	Electrical and Electronic Technology	EGE327	3
15	Sustainable Energy Engineering	EGE328	3
16	Practices of Energy Technology	EGE329	6
17	Innovation Management and Entrepreneurship	EGE308	4
18	Thesis I	EGE406	5
19	Thesis II	EGE407	5
Total Credit Value (Major Core Courses)			65

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

No.	Name of Course	Course Code	Credit Value
1	Industrial Training	EGE307	8
Total Credit Value (Industrial Training)			8

Major Elective Courses (courses marked with asterisk*)

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

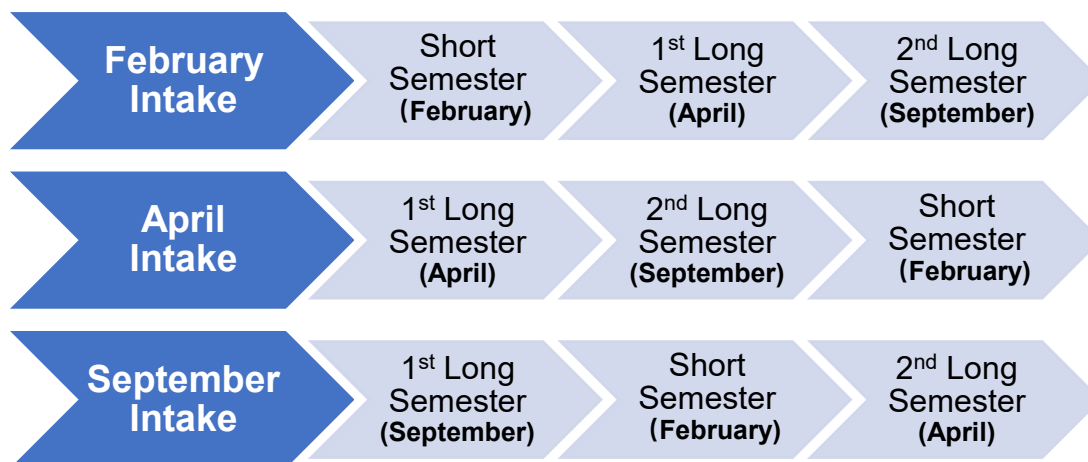
For major elective courses, students are required to choose designated courses based on the table below:

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

No.	Name of Course	Course Code	Credit Value	Remarks
1	Nuclear Energy Engineering	EGE417*	3	Student to choose SIX (6) courses (Total 18 credits)
2	Photoenergy and Resource Conversion	EGE420*	3	
3	Advanced Biomass Conversion Technologies	EGE422*	3	
4	Semiconductor Physics	EGE423*	3	
5	Fuel Cell Technology	EGE424*	3	
6	Nanotechnology and Nanomaterials	EGE425*	3	
7	Additive Manufacturing	EGE426*	3	
8	Power Electronics in Renewable Energy Systems	EGE427*	3	
9	Upgrading Biomass for High-Value Products	EGE428*	3	
10	Advanced Hydrogen Technology	EGE429*	3	
11	Optoelectronics	EGE430*	3	
12	Unit Operations	EGE431*	3	
Total Credit Value (Major Elective Courses)			18	

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	General Chemistry	BSC103	Common Core	3
		General Chemistry Laboratory	BSC104	Common Core	2
		Linear Algebra	BSC124	Common Core	3
		Fundamentals of Renewable Energy Engineering	EGE105	Major Core	3
		Energy Economics, Policy and Project Management	EGE106	Major Core	3
		Bahasa Melayu Komunikasi 2 (International)	MPU1012	Compulsory - MPU	2
		Aspirasi Negara Bangsa (Malaysian)	MPU1032	Compulsory - MPU	
		Total Credit Value			16
	2 nd Long Semester	General Physics Laboratory	BSC108	Major Core	2
		Calculus I A	BSC121	Common Core	5
		General Physics	EGE107	Major Core	4
		Engineering Drawing	EGE206	Major Core	3
		Citra Malaysia (International)	MPU1052	Compulsory - MPU	2
		Falsafah dan Cabaran Semasa (Malaysian)	MPU1042	Compulsory - MPU	
		General Elective Course (Selected from Table 2b)	Gxxxx	General Elective	4
		Total Credit Value			18

Year	Semester	Course Name	Course Code	Classification	Credit
Year 2	Short Semester	General Elective Subject	Gxxxx	General Elective	2
		AI-Copiloted Coding for Engineering	G0412	Compulsory - University	2
		Integrity and Anti-Corruption	MPU1022	Compulsory - MPU	2
		Total Credit Value			6
	1 st Long Semester	Calculus II	BSC123	Common Core	5
		Analytical Chemistry	BSC209	Common Core	3
		Applied Chemistry	EGE207	Major Core	3
		Foundation of Materials Science	EGE208	Major Core	3
		Technology of Electrochemical Power Sources	EGE209	Major Core	3
		Writing for Professional Purposes	MPU2022	Compulsory - MPU	2
		Bahasa Kebangsaan A	MPU2012	Compulsory - MPU	
		Total Credit Value			19
	2 nd Long Semester	Probability and Statistics B	BSC126	Common Core	2
		Python Programming Language	BSC135	Common Core	3
		Electrical Principles	EGE210	Major Core	3
		Engineering Thermodynamics	EGE211	Major Core	3
		Engineering Fluid Mechanics	EGE212	Major Core	3
		Community Service	MPU4012	Compulsory - MPU	2
		Total Credit Value			16
	Short Semester	Principles of Management	G0206	Compulsory - University	2
		Business Strategy	G0221	Compulsory - University	2
		Artificial Intelligence and Malaysia's Digital Economy	MPU3012	Compulsory - MPU	2
		Total Credit Value			6
Year 3	1 st Long Semester	Solar Energy Engineering	EGE325	Major Core	3
		Modeling and Simulation in Energy Engineering	EGE326	Major Core	3
		Electrical and Electronic Technology	EGE327	Major Core	3
		Sustainable Energy Engineering	EGE328	Major Core	3
		Practices of Energy Technology	EGE329	Major Core	6
		Total Credit Value			18
	2 nd Long Semester	Industrial Training	EGE307	Industrial Training	8
		Total Credit Value			8
	Short Semester	Innovation Management and Entrepreneurship	EGE308	Major Core	4
		Total Credit Value			4
Year 4	1 st Long Semester	Thesis I	EGE406	Major Core	5
		Students choose 3 courses (Total 9 credits):			
		Nuclear Energy Engineering	EGE417*	Major Elective	3

Year	Semester	Course Name	Course Code	Classification	Credit	
		Photoenergy and Resource Conversion	EGE420*	Major Elective	3	
		Advanced Biomass Conversion Technologies	EGE422*	Major Elective	3	
		Semiconductor Physics	EGE423*	Major Elective	3	
		Fuel Cell Technology	EGE424*	Major Elective	3	
		Nanotechnology and Nanomaterials	EGE425*	Major Elective	3	
		Additive Manufacturing	EGE426*	Major Elective	3	
		Power Electronics in Renewable Energy Systems	EGE427*	Major Elective	3	
		Upgrading Biomass for High-Value Products	EGE428*	Major Elective	3	
		Advanced Hydrogen Technology	EGE429*	Major Elective	3	
		Optoelectronics	EGE430*	Major Elective	3	
		Unit Operations	EGE431*	Major Elective	3	
		Total Credit Value				14
		2 nd Long Semester	Thesis II	EGE407	Major Core	5
	Students choose 3 course (Total 9 credits):					
	Nuclear Energy Engineering		EGE417*	Major Elective	3	
	Photoenergy and Resource Conversion		EGE420*	Major Elective	3	
	Advanced Biomass Conversion Technologies		EGE422*	Major Elective	3	
	Semiconductor Physics		EGE423*	Major Elective	3	
	Fuel Cell Technology		EGE424*	Major Elective	3	
	Nanotechnology and Nanomaterials		EGE425*	Major Elective	3	
	Additive Manufacturing		EGE426*	Major Elective	3	
	Power Electronics in Renewable Energy Systems		EGE427*	Major Elective	3	
	Upgrading Biomass for High-Value Products		EGE428*	Major Elective	3	
	Advanced Hydrogen Technology		EGE429*	Major Elective	3	
	Optoelectronics		EGE430*	Major Elective	3	
	Unit Operations		EGE431*	Major Elective	3	
	Total Credit Value				14	
	Short Semester	General Elective Subject	Gxxxx	General Elective	6	
		Total Credit Value				6
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	Prerequisite	Corequisite
BSC104	General Chemistry Laboratory	-	BSC103 General Chemistry
BSC123	Calculus II	BSC121 Calculus I A	-
BSC209	Analytical Chemistry	BSC103 General Chemistry	-
EGE207	Applied Chemistry	BSC103 General Chemistry	-
EGE307	Industrial Training	Obtained a minimum CGPA of 2.00	-
EGE326	Modeling and Simulation in Energy Engineering	EGE304 Engineering Thermodynamics	-
		EGE306 Engineering Fluid Mechanics	-
EGE327	Electrical and Electronic Technology	EGE210 Electrical Principles	-
EGE328	Sustainable Energy Engineering	EGE105 Fundamentals of Renewable Energy Engineering	-
EGE406	Thesis I	EGE401 Practices of Energy Technology	-
EGE407	Thesis II	EGE406 Thesis I	-
EGE422*	Advanced Biomass Conversion Technologies	EGE431* Unit Operations	-
EGE427*	Power Electronics in Renewable Energy Systems	EGE327 Electrical and Electronic Technology	-
EGE428*	Upgrading Biomass for High-Value Products	EGE431* Unit Operations	-

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.

New Energy Science and 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.