



XIAMEN UNIVERSITY MALAYSIA

廈門大學 馬來西亞分校

PROGRAMME HANDBOOK

BACHELOR OF
ROBOTICS AND AUTOMATION
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

Through a carefully curated curriculum, students will delve into various aspects of robotics, including electronics, control systems, and artificial intelligence. By integrating knowledge from multiple disciplines, the programme aims to equip students with the skills and expertise necessary to excel in the robotics and automation-related industries.

3. PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The PEOs are to produce graduates who are:

Professionalism

PEO1

Graduates will be capable of using problem-solving techniques and critical analysis to establish themselves as practising professionals and demonstrate leadership skills and entrepreneurial spirit in the field of Smart Robotics and Automation or related fields.

Continuous Personal Development

PEO2

Graduates will engage in a lifelong pursuit of knowledge and interdisciplinary learning appropriate for industrial and academic careers.

Societal Engagement

PEO3

Graduates will contribute to sustainable development and the well-being of society.

4. PROGRAMME LEARNING OUTCOMES (PLO)

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

PLO1	Knowledge and Understanding	Apply knowledge of mathematics, natural sciences, computing, robotics and automation engineering fundamentals with engineering specialisation principles to define and utilise engineering procedures, processes, systems and methodologies.
PLO2	Problem Analysis	Identify, formulate, research literature and analyse complex engineering problems in the domain of smart robotics and automation, reaching substantial conclusions based on the principles of mathematics, natural sciences, and engineering sciences with holistic considerations for sustainable development.
PLO3	Design/ Development of Solutions	Design solutions for complex engineering problems and systems, components or processes in the domain of smart robotics and automation that meet specified needs in accordance with the Sustainable Development Goals (SDGs), with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
PLO4	Investigation	Conduct investigation into complex engineering problems relevant to smart robotics and automation using research-based knowledge and research methods, including research literature, design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PLO5	Tool Usage	Create, select and apply appropriate robotics and automation-related techniques, resources, modern engineering and artificial intelligence tools to solve complex engineering problems, with an understanding of the limitations.
PLO6	The Engineer and the World	Analyse and evaluate the impacts of robotics and automation solutions on society, sustainability, health and safety, legal frameworks, and the environment when addressing complex engineering challenges.
PLO7	Ethics	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 of diversity and inclusion.
PLO8	Individual and Collaborative Team Work	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	Project Management and Finance	Apply knowledge and understanding of engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PLO11	Life Long Learning	Recognise the need for and have the preparation and ability to engage in independent and life-long learning, adaptability to new and emerging technologies and critical thinking in the broadest context of technological change.

5. EXPECTED AREAS OF GRADUATE EMPLOYMENT

Our graduates will have the opportunities to work in many industries, including:

- Industrial Automation Engineer
- Robotic Systems Integration Specialist
- Production Optimization Specialist
- Automation Consultant
- Medical Robotics Engineer
- Logistics Automation Engineer
- Warehouse Robotics Engineer
- Drone Technology Specialist
- Robotic Process Automation Engineer
- Intelligent Agricultural Robotics Engineer
- Precision Agriculture Solutions Developer
- AI and Machine Learning Specialist
- Lecturer, Education and Training
- Autonomous Vehicle Engineer
- Robotics Consultant
- Governmental Technology Policy Consultant

6. CURRICULUM STRUCTURE

The minimum requirement for graduation will be **143** 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	Engineering Core	93	65.0%
	• Mathematics/Physics (12)		
	• Engineering Fundamentals (24)		
	• Computing/Artificial Intelligence (18)		
	• Robotics (12)		
	• Automation (18)		
2	Engineering Elective	18	12.6%
3	Projects	12	8.4%
4	Industrial Training	4	2.8%
5	Core General Education (MPUs)	12	8.4%
6	Elective General Education	4	2.8%
	Total Credit Value	143	100%

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 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 Robotic and Automation Engineering shall achieve at least a total of 4 credits comprising 2 compulsory credits from Group IV (Artificial Intelligence) and the remaining 2 credits from either Group I (Arts) or Group II (Business).

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/ G1XXX		Minimum 2 credits
OR				
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		
Group IV (Artificial Intelligence)				
	Group IV comprises general elective courses in the field of Artificial Intelligence , comprising: • Discipline-based (Compulsory)	G04XX	2	Compulsory
Total Credit Value (General Elective Courses)			4	

*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.*

Engineering Core Courses

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

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

No.	Name of Course	Course Code	Credit Value
1	Python and Tensorflow Programming	ERA111	3
2	Circuit Theory	ERA113	3
3	Computer Architecture	ERA112	3
4	Electronics 1	ERA114	3
5	Engineering Mathematics 1	ERA115	3
6	Principles of Artificial Intelligence	ERA121	3
7	Digital Logic Design	ERA123	3
8	Engineering Mathematics 2	ERA126	3
9	Electronics 2	ERA125	3
10	Programming C	ERA124	3
11	Introduction to Machines and Power Systems	ERA122	3
12	Machine Learning	ERA212	3
13	Data Structures	ERA213	3
14	Signals and Systems	ERA214	3
15	Engineering Mechanics	ERA211	3
16	Instrumentations and Measurements	ERA215	3
17	Engineering Mathematics 3	ERA216	3
18	Deep Learning	ERA222	3
19	Digital Signal Processing	ERA224	3
20	Computer Aided Design	ERA221	3
21	Control Theory	ERA223	3
22	Embedded Systems	ERA312	3
23	Robot Kinematics and Dynamics	ERA313	3
24	Power Technology	ERA323	3
25	Industrial Automation	ERA322	3
26	Engineering Management	ERA324	3
27	Engineers and the World	ERA325	3
28	ROS, SLAM, and Mobile Robotics	ERA413	3
29	Computer Vision	ERA412	3
30	Manufacturing and Operations Management	ERA414	3
31	Advanced Robotics	ERA422	3
Total Credit Value (Engineering Core Courses)			93

Table 2d: Components of the **Final Year Project** and its Value

No.	Name of Course	Course Code	Credit Value
1	Integrated Design Project 1	ERA311	3
2	Integrated Design Project 2	ERA321	3
3	Final Year Project 1	ERA411	3
4	Final Year Project 2	ERA421	3
Total Credit Value (Project)			12

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

No.	Name of Course	Course Code	Credit Value
1	Industrial Training	ERA331	4
Total Credit Value (Industrial Training)			4

Engineering Elective Courses

Engineering 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 **Engineering Elective** Courses and its Value

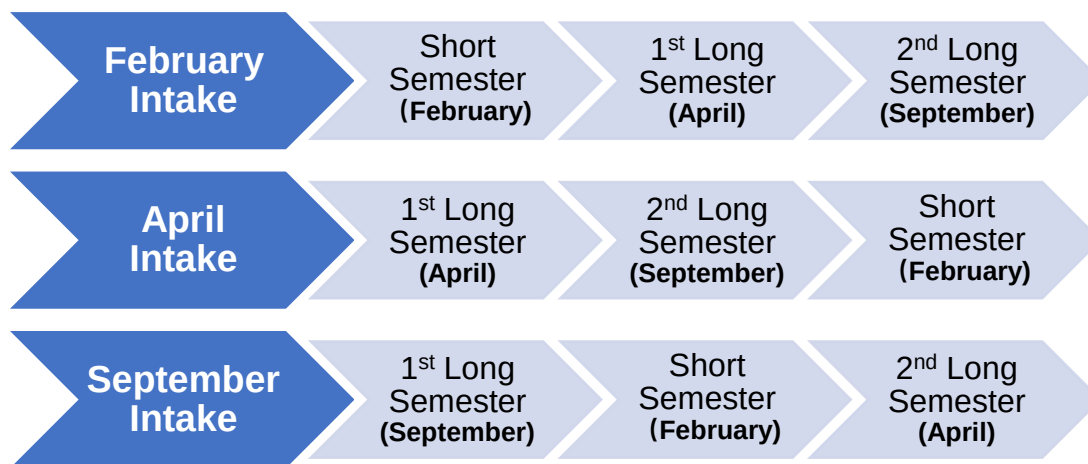
No.	Name of Course	Course Code	Credit Value	Remarks
1	Information Security	ERA201	3	In Year 2 , student need to select 2 courses (6 credits) from this package
2	Nanotech	ERA202	3	
3	Optoelectronic Technology	ERA203	3	
4	Random Signals and Noise	ERA204	3	
Total Credit Value (Engineering Elective Courses)			6	

No.	Name of Course	Course Code	Credit Value	Remarks
1	Algorithms in Data Structures	ERA301	3	In Year 3 , student need to select 4 courses (6 credits) from this package
2	Deep Reinforcement Learning and Control	ERA302	3	
3	Natural Language Processing	ERA303	3	
4	Strategic Reasoning for AI	ERA304	3	
Total Credit Value (Engineering Elective Courses)			6	

No.	Name of Course	Course Code	Credit Value	Remarks
1	Advance Embedded Microcontroller Systems	ERA401	3	In Year 4 , student need to select 2 courses (6 credits) from this package
2	Big Data Analytics	ERA402	3	
3	Planning Techniques for Robotics	ERA403	3	
4	Technology and Application of Internet of Things	ERA404	3	
Total Credit Value (Engineering Elective Courses)			6	

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	Python and Tensorflow Programming	ERA111	Engineering Core	3
		Circuit Theory	ERA113	Engineering Core	3
		Computer Architecture	ERA112	Engineering Core	3
		Electronics 1	ERA114	Engineering Core	3
		Engineering Mathematics 1	ERA115	Engineering Core	3
		Total Credit Value			
	2 nd Long Semester	Principles of Artificial Intelligence	ERA121	Engineering Core	3
		Digital Logic Design	ERA123	Engineering Core	3
		Engineering Mathematics 2	ERA126	Engineering Core	3
		Electronics 2	ERA125	Engineering Core	3
		Programming C	ERA124	Engineering Core	3
		Introduction to Machines and Power Systems	ERA122	Engineering Core	3

Year	Semester	Course Name	Course Code	Classification	Credit
	Short Semester	Total Credit Value			18
		Bahasa Melayu Komunikasi 2	MPU1012	Compulsory	2
		Aspirasi Negara Bangsa (Malaysian Nation-State Aspiration)	MPU1032	Compulsory	
		Falsafah dan Cabaran Semasa	MPU1042	Compulsory	2
		Citra Malaysia (Malaysian Citra)	MPU1052	Compulsory	
		Total Credit Value			4
Year 2	1 st Long Semester	Machine Learning	ERA212	Engineering Core	3
		Data Structures	ERA213	Engineering Core	3
		Signals and Systems	ERA214	Engineering Core	3
		Engineering Mechanics	ERA211	Engineering Core	3
		Instrumentations and Measurements	ERA215	Engineering Core	3
		Engineering Mathematics 3	ERA216	Engineering Core	3
		Total Credit Value			
	2 nd Long Semester	Deep Learning	ERA222	Engineering Core	3
		Digital Signal Processing	ERA224	Engineering Core	3
		Computer Aided Design	ERA221	Engineering Core	3
		Control Theory	ERA223	Engineering Core	3
		Choose two (2) courses (6 credits)			
		Information Security	ERA201	Engineering Elective	3
		Nanotech	ERA202	Engineering Elective	3
		Optoelectronic Technology	ERA203	Engineering Elective	3
		Random Signals and Noise	ERA204	Engineering Elective	3
		Total Credit Value			18
	Short Semester	Bahasa Kebangsaan A	MPU2012	Compulsory	2
		Writing for Professional Purposes	MPU2022	Compulsory	
		Integriti dan Antirasuah (Integrity and Anti-Corruption)	MPU1022	Compulsory	2
		Total Credit Value			4
Year 3	1 st Long Semester	Integrated Design Project 1	ERA311	Project	3
		Embedded Systems	ERA312	Engineering Core	3
		Robot Kinematics and Dynamics	ERA313	Engineering Core	3
		Choose two (2) courses from Major Elective			
		Algorithms in Data Structures	ERA301	Engineering Elective	3

Year	Semester	Course Name	Course Code	Classification	Credit
		Deep Reinforcement Learning and Control	ERA302	Engineering Elective	3
		Natural Language Processing	ERA303	Engineering Elective	3
		Strategic Reasoning for AI	ERA304	Engineering Elective	3
		Total Credit Value			15
	2 nd Long Semester	Integrated Design Project 2	ERA321	Project	3
		Power Technology	ERA323	Engineering Core	3
		Industrial Automation	ERA322	Engineering Core	3
		Engineering Management	ERA324	Engineering Core	3
		Engineers and the World	ERA325	Engineering Core	3
		Total Credit Value			15
	Short Semester	Industrial Training	ERA331	Industrial Training	4
		Total Credit Value			
Year 4	1 st Long Semester	Final Year Project 1	ERA411	Project	3
		ROS, SLAM, and Mobile Robotics	ERA413	Engineering Core	3
		Computer Vision	ERA412	Engineering Core	3
		Manufacturing and Operations Management	ERA414	Engineering Core	3
		Artificial Intelligence and Malaysia's Digital Economy	MPU3012	Compulsory	2
		Total Credit Value			14
	2 nd Long Semester	Final Year Project 2	ERA421	Project	3
		Advanced Robotics	ERA422	Engineering Core	3
		Community Service	MPU4012	Compulsory	2
		Choose two (2) courses from Major Elective			
		Advance Embedded Microcontroller Systems	ERA401	Engineering Elective	3
		Big Data Analytics	ERA402	Engineering Elective	3
		Planning Techniques for Robotics	ERA403	Engineering Elective	3
		Technology and Application of Internet of Things	ERA404	Engineering Elective	3
		Total Credit Value			
	Short Semester	Selection from General Electives	Gxxxx	Elective General Education	2
		General Elective Course (Group IV Discipline-based)	G4xxx	Elective General Education	2
		Total Credit Value			4
	Grand Total				143

8. PREREQUISITE COURSES

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

Course Code	Course Name	Prerequisites
ERA126	Engineering Mathematics 2	ERA115 Engineering Mathematics 1
ERA213	Data Structures	ERA111 Python and Tensorflow Programming
ERA216	Engineering Mathematics 3	ERA126 Engineering Mathematics 2
ERA221	Computer Aided Design	ERA211 Engineering Mechanics
ERA222	Deep Learning	ERA212 Machine Learning
ERA223	Control Theory	ERA113 Circuit Theory
ERA224	Digital Signal Processing	ERA214 Signals and Systems
ERA311	Integrated Design Project 1	Completed 51 credit hours on engineering core courses
ERA312	Embedded Systems	ERA112 Computer Architecture
ERA313	Robot Kinematics and Dynamics	ERA115 Engineering Mathematics 1
ERA321	Integrated Design Project 2	ERA311 Integrated Design Project 1
ERA322	Industrial Automation	ERA215 Instrumentations and Measurements
ERA323	Power Technology	ERA122 Introduction to Machines and Power Systems
ERA331	Industrial Training	Completed 51 credit hours on engineering core courses
ERA411	Final Year Project 1	Completed 69 credit hours on engineering core courses
ERA412	Computer Vision	ERA121 Principles of Artificial Intelligence
ERA413	ROS, SLAM, and Mobile Robotics	ERA313 Robot Kinematics and Dynamics
ERA421	Final Year Project 2	ERA411 Final Year Project 1
ERA422	Advanced Robotics	ERA413 ROS, SLAM, and Mobile Robotics

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.

Robotics and Automation 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.