

CURRICULUM STRUCTURE**PROGRAMME: BACHELOR OF MECHATRONICS ENGINEERING WITH HONOURS****TYPE: FULL TIME****BATCH: 261 AND ABOVE**

TYPE OF COURSES	CREDIT HOUS	ELEMENT
A. University Required Courses (UNICORE)	18	ENGLISH, BAHASA MELAYU, TILAWAH, ARABIC LANGUAGE, SKILL, MPUG, UNGS, CO-CU
B. Kulliyah Required Courses (KRC)	17	MATH, GENE (GENE 4302, GENE 4210)
C. Engineering Core Courses	86	MCTB (excluding Engineering Electives)
D. Engineering Elective Courses	15	Engineering Elective
TOTAL	136	

A. UNIVERSITY REQUIRED COURSES (UNICORE)

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	UNGS 1213	Tawhidic Epistemology and Islamic Worldview	2	UNGS 1213	Year 1
2	CCUB 1000	Usrah	1		Year 1
3	LEED 1201	Academic English for Sustainability	2	LEED 1011/1012/1013/1014/Exit EPT	Year 1
4	MPUG 3122 / UNGS 3122	Falsafah dan Cabaran Semasa (for Malaysian) / Philosophy and Contemporary Challenges (for non-Malaysian)	2		Year 1
5	MPUG 3112 / MPUG 3142	Aspirasi Negara Bangsa (for Malaysian) / Malaysian Citra (for Non-Malaysian)	2		Year 2
6	LQAD 1113 / LQAD 1131	Arabic for Understanding Ibadah I / Arabic for Effective Communication I*	1/1	TQTD 1001	Year 2
7	LQAD 2123 / LQAD2232	Arabic for Understanding Ibadah II / Arabic for Effective Communication II*	1 / 2*	LQAD 1113 / LQAD 1131	Year 2
8	LMBD 3204 / MPUG 3162 /	Bahasa Melayu Kerjaya (Sains dan Teknologi) (for	2		Year 3

	MPUG 3152	Malaysian) / Bahasa Melayu Komunikasi (Nusantara) / Bahasa Melayu Komunikasi (Others)			
9	TQTD 1002	Tilawah Al-Qur'an 1 (for Muslim)	0.5	TPT/TQTD 1001	Year 3
10	CCLF 2000	Leadership and Family Management	1	CCUB 1000	Year 3
11	CCSS 3000	Skill	1	CCUB 1000	Year 3
12	TQTD 2002	Tilawah Al-Qur'an 2 (for Muslim)	0.5	TPT/TQTD 1002	
13	MPUG 3132	Integrity and Anti- Corruption	2		

B. KULLIYAH REQUIRED COURSES (KRC)

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MATH 1311	Engineering Mathematics	3		Year 1
2	MATH 1322	Vector Calculus	3		Year 1
3	MATH 2312	Differential Equations	3		Year 2
4	MATH 2331	Statistics and Numerical Methods	3		Year 2
5	GENE 4210	Technology Entrepreneurship	2		Year 4
6	GENE 4302	Engineering Ethics, Safety and Sustainability	3		Year 4

C. ENGINEERING CORE COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	ECEE 1301	Electric Circuits	3		Year 1
2	ECEE 1101	Electrical Engineering Lab 1	1	ECEE 1301	Year 1
3	ECEE 1303	Electronics	3	ECEE 1301	Year 1
4	MECA 1240	Thermal Science	2		Year 1
5	MECA 1340	Engineering Mechanics	3		Year 1
6	GENE 1201	Computer Aided Drawing (CAD)	2		Year 1
7	MFGB 1203	Workshop Technology	2	GENE 1201	Year 1
8	MCTB 1201	Mechatronics Workshop	2	MCTB 1371	Year 1
9	MCTB 1371	Introduction to Programming	3		Year 1

10	MCTB 2102	Mechatronics Lab 1	1	MCTB 2231 MECA 1240 MCTB 2331	Year 2
11	MCTB 2203	Mechatronics Interfacing Lab	2	MCTB 1201 MCTB 2312	Year 2
12	MCTB 2231	Fundamentals of Fluid Mechanics	2	MECA 1340	Year 2
13	MCTB 2232	System Dynamics	2	MATH 1322	Year 2
14	MCTB 2311	Electrical Machines	3	ECEE 1301	Year 2
15	MCTB 2312	Digital Systems Design and Microprocessors	3	ECEE 1303	Year 2
16	MCTB 2314	Signal and System Analysis	3	MATH 1322 ECEE 1303	Year 2
17	MCTB 2315	Instrumentation and Measurement	3	ECEE 1303	Year 2
18	MCTB 2331	Mechanisms and Machine Design	3	MECA 1340	Year 2
19	MCTB 3104	Mechatronics Lab 2	1	MCTB 2315 MCTB 3351 MCTB 2312	Year 3
20	MCTB 3331	Engineering Design and Reliability	3	MATH 2331	Year 3
21	MCTB 3332	Fundamentals of Robotics	3	MCTB 2232	Year 3
22	MCTB 3351	Control Systems 1	3	MCTB 2232	Year 3
23	MCTB 3352	Industrial Automation	3	MCTB 2315	Year 3
24	MCTB 3353	Control Systems 2	3	MCTB 3351	Year 3
25	MCTB 3371	Computational Intelligence	3	MATH 1311	Year 3
26	MCTB 3391	Integrated Design Project	3	MCTB 2203 MCTB 3331	Year 3
27	GENE 3342	Project Management and Engineering Economics	3	MATH 1311	Year 3
28	MCTB 3510	Engineering Industrial Training	5	90 CHrs	Year 3
29	MCTB 4105	Mechatronics Lab 3	1	MCTB 3332 MCTB 3352	Year 4
30	MCTB 4311	Digital Signal Processing	3	MCTB 2314	Year 4
31	MCTB 4312	Power Electronics	3	MCTB 2311	Year 4
32	MCTB 4398	Final Year Project 1	3	MCTB 3352	Year 4
33	MCTB 4399	Final Year Project 2	3	MCTB 3510 MCTB 4398	Year 4

D. ENGINEERING ELECTIVE COURSES

Students must complete all three specialization elective courses within a stream to be awarded that specialization (Group 1 – Group 3). The additional two elective courses may be taken from any stream, as listed below:

Group 1: Robotics and Automation Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4321	Autonomous Robotic System	3	MCTB 3352	
2	MCTB 4322	Smart Manufacturing	3	MCTB 3352	
3	MCTB 4323	Smart Infrastructure	3	MCTB 3352	

Group 2: Artificial Intelligence Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4341	Machine Learning	3	MCTB 3371	
2	MCTB 4342	Deep Learning for Machine Vision	3	MCTB 3371	
3	MCTB 4343	Applied Generative AI	3	MCTB 3371	

Group 3: Control and Instrumentation Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4361	Modern Control Design	3	MCTB 2314	
2	MCTB 4362	System Modeling and Identification	3	MCTB 2314	
3	MCTB 4363	Industrial Instrumentation	3	MCTB 2314	

Group 4: Robotics and Automation Additional Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4324	Underwater and Aerial Robotics	3	MCTB 2312, MCTB 3352	
2	MCTB 4325	Fluid Power Systems	3	MCTB 3352	
3	MCTB 4326	Mechanism Synthesis and Dynamics	3	MCTB 3352	
4	MCTB 4327	Robot Operating System	3	MCTB 3352	

Group 5: Artificial Intelligence Additional Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4344	Software Engineering for AI Deployment	3	MCTB 3371	
2	MCTB 4345	Deep Reinforcement Learning for Robotics Intelligence	3	MCTB 3371	
3	MCTB 4346	Autonomous AI Agent	3	MCTB 3371	
4	MCTB 4347	Embedded Artificial Intelligence	3	MCTB 3371	

Group 6: Control and Instrumentation Additional Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4364	Biomedical Instrumentation	3	MCTB 2314	
2	MCTB 4365	Biomechatronics	3	MCTB 2314	
3	MCTB 4366	Embedded Systems	3	MCTB 2312, MCTB 2314	
4	MCTB 4367	Vibration Analysis and Control	3	MCTB 2314	

Group 7: General Elective Courses

No.	Course Code	Course Title	Credit Hours	Pre-requisite	Requirement
1	MCTB 4381	Electronic Instrumentation and Design	3	MCTB 2315	
2	MCTB 4382	Thermal and Fluid Machineries	3	MCTB 2231	
3	MCTB 4383	Industrial Robotics	3	MCTB 3332	
4	MCTB 4384	Electrical Power System Analysis	3	MCTB 2311	
5	MCTB 4385	Robotics Technology & Applications	3		
6	MCTB 4386	Artificial Intelligence Essentials for Learners	3		
7	MCTB 4387	Real Time Systems	3	MCTB 2312	
8	MCTB 4388	Micromechatronics	3	MCTB 2311	