

برنامج هندسة الميكاترونيا بالسيارات

Automotive Mechatronics Engineering Program

الهيكل العام للبرنامج

عدد المقررات	%	عدد الساعات المعتمدة			مجموعة المقررات
		الاجمالي	المقررات الاختيارية	المقررات الاجبارية	
6	%7.6	11	6	5	متطلبات الجامعة
10	%20	29	6	23	متطلبات الكلية
24	%44.1	64	6	58	متطلبات التخصص العام
15	%28.2	41	6	35	متطلبات التخصص الدقيق
55	%100	145	(16.6%) 24	(83.4%)121	الاجمالي

جدول رقم (38) مقررات برنامج هندسة الميكاترونيات بالسيارات وساعاته المعتمدة

Courses & Credit Hours of Automotive Mechatronics Engineering Program

No.	Type	Course			Credit CH	prerequisite code	ECTS	SWL	Contact Hours				
		Level (1-4)	Code	Course Title					Lec	Tut	Lab	Σ	
1	University Requirement	1	HUM111	Technical English Language	2		3	75	2	0	0	2	
2		1	HUM131	Societal Issues	1		2	50	1	0	0	1	
3		1	HUM141	Topics in Energy, Water & Environmental	2		3	75	2	0	0	2	
4		1	HUM121	Elective (1) Research and Analysis Skills Principles of Negotiation	2		3	75	2	0	0	2	
5		1	HUM123		Elective (2) Communication Skills Professional Ethics and Legislations	2		3	75	2	0	0	2
6		2	HUM242	Elective (3) Occupational Health and Safety History of Civilization German Language		2		3	75	2	0	0	2
		HUM232											
		HUM212											
7	Faculty Requirement	1	BSE111	Engineering Mathematics (1)	3	---	5	125	2	3	0	5	
8		1	BSE121	Physics (1)	3	---	5	125	2	1	2	5	
9		1	BSE112	Engineering Mathematics (2)	3	BSE111	5	125	2	3	0	5	
10		1	BSE122	Physics (2)	3	BSE121	5	125	2	1	2	5	
11		1	BSE131	Engineering Chemistry	3	---	5	125	2	1	2	5	
12		1	BSE113	Probability and Statistics	3	BSE111	4	100	2	2	0	4	
13		1	BSE141	Engineering Mechanics (1)	2	---	4	100	2	1	0	3	
14		1	MDE101	Engineering Drawing & Projection	3	---	5	125	2	3	0	5	
15		2	BSE261	Elective (4) Numerical Analysis Advanced Mathematical Analysis	3	BSE112	4	100	2	2	0	4	
16		2	BSE214		Elective (5) Operation Research Physics (3)	3	BSE112	4	100	2	2	0	4
			BSE224				BSE112						
			BSE223				BSE122						
17		General Speciality	1	BSE142	Engineering Mechanics (2)	3	BSE141	3	75	2	2	0	4
18			1	MDE121	Production Technology	2		3	75	1	0	3	4
19			2	MDE212	Mechanical Drawing with PC	3	MDE101	5	125	2	0	3	5
20			2	MDE221	Material Science	2		4	100	2	1	0	3
21	2		MPE271	Thermodynamics	2	BSE122	4	100	2	1	0	3	
22	3		MDE322	Stress Analysis	3	MDE221	4	100	2	2	0	4	
23	3		AUT321	Modeling and Simulation	2	BSE111	4	100	2	1	0	3	
24	2		EPE211	Electrical Engineering	3	BSE112	3	75	2	0	3	5	
25	3		AUT323	Technical Report Writing	2	HUM111	4	100	2	0	0	2	
26	2		MPE221	Fundamentals of Fluid Mechanics	3	BSE122	5	125	2	0	3	5	
27	3		MDE331	Mechanical Vibration	3	BSE142	4	100	2	2	0	4	
28	3		AUT324	Automatic Control	3	AUT321	5	125	2	2	0	4	
29	2		ECE211	Electronic Engineering	3	BSE122	4	100	2	0	3	5	
30	3		EPE311	Electric Machines	3	EPE211	4	100	2	2	0	4	
31	3		EPE312	Introduction to Power Electronics	3	ECE211	5	125	2	0	3	5	
32	2		MPE213	Engineering Measurements	3	BSE122	5	125	2	0	3	5	
33	3		AUT341	Automotive Electrical Circuits and Systems	3	AUT251	5	125	2	0	3	5	
34	3		MPE331	Principles of Heat Transfer	2	MPE271	5	125	1	0	3	4	
35	3		ECE213	Computer Programming	3		4	100	2	0	3	5	
36	3		AUT322	Mechatronics	2	MPE213	4	100	1	0	3	4	
37	3		MPE341	Internal Combustion Engines	2	MPE271	4	100	2	0	1	3	
38	2		AUT251	Vehicle Technology	3	AUT211	5	125	2	0	3	5	
39	3		AUT312	Elective (6) Computerized Maintenance Management	3		5	125	2	2	0	4	

40	3	AUT313	Operations Research	3	5	125	2	2	0	4								
		AUT314									Automotive Engines Alternative Fuels	MPE341	5	125	2	2	1	5
		AUT315									Automotive Air Conditioning	MPE331	5	125	2	0	3	5
		ECE311	Elective (7)	3	5	125	2	2	0	4								
		AUT325									Introduction to Artificial Intelligence	MPE221	5	125	2	2	0	4
AUT351	Vehicle Aerodynamics	MPE221									5	125	2	2	1	5		
AUT316	Hydraulic and Pneumatic Control Systems	AUT314									5	125	2	2	0	4		
			Fuel Cell Technology															
41	Sub Specialty	2	AUT211	Automotive Engineering Laboratories	1	18 Cr Hr	2	50	0	0	3	3						
42		3	AUT342	Electric and Hybrid Vehicle Technology	3	AUT251	5	125	2	0	3	5						
43		4	AUT411	Automotive Fault Diagnosis	3	AUT251	5	125	2	0	3	5						
44		4	ECE411	Microcontrollers	3	ECE213	5	125	2	0	3	5						
45		4	AUT422	Vehicle Dynamics	3	MDE331	5	125	2	2	0	4						
46		4	AUT431	Automotive Chassis Design	3	MDE322	5	125	2	2	0	4						
47		4	AUT421	Performance of Electric and Hybrid Vehicles	3	AUT251	5	125	2	2	0	4						
48		4	AUT423	Automotive Mechatronics Systems Design	3	AUT324, AUT422	5	125	2	2	0	4						
49		4	AUT412	Automotive Maintenance	3	AUT411	5	125	2	0	3	5						
50		2	ECE212	Digital Systems Design	3	ECE211	5	125	2	0	3	5						
51		4	ECE412	Embedded Systems	3	ECE411	5	125	2	0	3	5						
52		4	AUT401	Graduation Project 1	2	100 C. H.	3	75	1	2	0	3						
53		4	AUT402	Graduation Project 2	2	AUT401	3	75	1	2	0	3						
54		4	AUT413	Elective (8)	3	5	125	2	2	0	4							
		AUT424	Automotive Preventive Maintenance									AUT412	2	2	0	4		
		AUT425	Intelligent Vehicle Technology									AUT423	2	2	0	4		
		AUT432	Automotive Safety Systems									AUT422	2	2	1	5		
			Automotive Body Design and Analysis	MDE322	2	2	0	4										
55	4	AUT433	Elective (9)	3	5	125	2	2	0	4								
		EPE411									Automotive Accident Analysis	AUT422	2	2	0	4		
		EPE412									Vehicle Energy Storage Systems	EPE312	2	2	1	5		
		ECE413									Automotive Power Electronics	ECE412	2	2	1	5		
			Automotive Embedded Systems															
Total				145		264	6625	126	72	71	269							

مصفوفة الجدارات الخاصة بمقررات برنامج هندسة الميكاترونيا بالسيارات

Competences Matrix of Automotive Mechatronics Engineering Program					General Competencies for Engineers (A)										Basic Mechanical Engineering Competencies (B)					Specialty Competencies (C)					
No.	Type	Level (1-4)	Code	Course Title	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3			
1	University Requirement	1	HUM111	Technical English Language								1	1									1	1		
2		1	HUM131	Societal Issues									1										1	1	
3		1	HUM141	Topics in Energy, Water & Environmental				1	1																
4		1	HUM121	Elective (1) Research and Analysis Skills										1	1										
			HUM122		Principles of Negotiation								1	1											
5		1	HUM123	Elective (2) Communication Skills		1		1				1		1	1								1	1	
		HUM124	Professional Ethics and Legislations					1					1										1	1	
6	2	HUM242	Elective (3) Occupational Health and Safety		1	1				1															
		HUM232		History of Civilization										1									1	1	
		HUM212		German Language										1	1								1	1	
7	Faculty Requirement	1	BSE111	Engineering Mathematics (1)	1	1																			
8		1	BSE121	Physics (1)	1							1													
9		1	BSE112	Engineering Mathematics (2)	1	1																			
10		1	BSE122	Physics (2)	1	1						1													
11		1	BSE131	Engineering Chemistry	1	1																			
12		1	BSE113	Probability and Statistics	1	1						1													
13		1	BSE141	Engineering Mechanics (1)	1	1	1																		
14		1	MDE101	Engineering Drawing & Projection	1	1						1													
15		2	BSE261	Elective (4) Numerical Analysis	1	1											1								
			BSE262		Advanced Deferential Equation																				
16		2	BSE214	Elective (5) Engineering Mathematics (3)	1	1																			
			BSE224		Operation Research	1	1																		
			BSE223		Physics (3)	1	1						1												
17		General Speciality	1	BSE142	Engineering Mechanics (2)	1	1	1																	
18	1		MDE121	Production Technology			1	1	1																
19	2		MDE212	Mechanical Drawing with PC	1	1			1								1	1	1						
20	2		MDE221	Material Science		1			1						1	1	1	1	1						
21	2		MPE271	Thermodynamics	1												1	1							
22	3		MDE322	Stress Analysis					1								1	1							
23	3		AUT321	Modeling and Simulation													1	1		1					
24	2		EPE211	Electrical Engineering	1				1		1					1									
25	3		AUT323	Technical Report Writing				1					1										1		
26	2		MPE221	Fundamentals of Fluid Mechanics												1	1	1							
27	3		MDE331	Mechanical Vibration											1	1									
28	3		AUT324	Automatic Control	1				1							1	1	1	1						
29	2		ECE211	Electronic Engineering	1											1		1							
30	3		EPE311	Electric Machines												1	1	1							
31	3		EPE312	Introduction to Power Electronics				1								1	1	1							
32	2		MPE213	Engineering Measurements												1	1								
33	3		AUT341	Automotive Electrical Circuits and Systems				1				1			1	1		1					1		
34	3		MPE331	Principles of Heat Transfer	1											1		1	1						
35	3		ECE213	Computer Programming						1						1			1						
36	3		AUT322	Mechatronics				1								1							1		
37	3	MPE341	Internal Combustion Engines												1		1					1			
38	2	AUT251	Vehicle Technology												1	1	1					1	1		
39	3	AUT312	Elective (6) Computerized Maintenance Management				1					1					1		1				1		
		AUT313		Operations Research		1											1						1		
		AUT314		Automotive Engines Alternative Fuels									1		1								1	1	
		AUT315		Automotive Air Conditioning																1					1
40	3	ECE311	Elective (7) Introduction to Artificial Intelligence							1								1				1	1		
		AUT325		Vehicle Aerodynamics																1			1	1	
		AUT351		Hydraulic and Pneumatic Control Systems								1						1		1			1	1	
		AUT316		Fuel Cell Technology																					

جداول رقم (40) المقررات الدراسية التخصصية لبرنامج هندسة الميكاترونيا بالسيارات

Course Tables Levels 1 to 4

Level 1 (Freshman)																	
Code	Course title	Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	اسم المقرر	
			Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark			
Semester (1)																	
HUM111	Technical English Language	—	2	3	75	2	—	—	2	40	20	—	40	100	3	لغة انجليزية فنية	
HUM131	Societal Issues	—	1	2	50	1	—	—	1	40	20	—	40	100	2	قضايا مجتمعية	
HUM141	Topics in Energy, Water and Environmenta	—	2	3	75	2	—	—	2	40	20	—	40	100	3	موضوعات في الطاقة و المياه و البيئة	
BSE111	Engineering Mathematics (1)	—	3	5	125	2	2	—	4	40	20	—	40	100	3	رياضيات هندسية (1)	
BSE121	Physics (1)	—	3	5	125	2	1	2	5	20	20	20	40	100	3	فيزياء (1)	
BSE131	Engineering Chemistry	—	3	4	100	2	1	2	4	20	20	20	40	100	3	كيمياء هندسية	
BSE141	Engineering Mechanics (1)	—	2	4	100	2	1	—	3	40	20	—	40	100	3	ميكانيكا هندسية (1)	
MDE111	Engineering Drawing and Projection	—	3	4	125	2	3	—	5	20	20	20	40	100	3	الرسم الهندسي والأسقاط	
			Σ	19	30	775	15	9	4	28							

Level 1 (Freshman)																	
Code	Course title	Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	اسم المقرر	
			Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark			
Semester (2)																	
—	Elective (1)	—	2	3	75	2	—	—	2	40	20	—	40	100	3	اختياري (1)	
—	Elective (2)	—	2	3	75	2	—	—	2	40	20	—	40	100	3	اختياري (2)	
BSE112	Engineering Mathematics (2)	BSE111	3	5	125	2	2	—	4	40	20	—	40	100	3	رياضيات هندسية (2)	
BSE122	Physics (2)	BSE121	3	5	125	2	1	1	4	20	20	20	40	100	3	فيزياء (2)	
BSE113	Probability and Statistics	BSE111	3	4	100	2	2	—	4	40	20	—	40	100	3	الاحتمالات والإحصاء	
BSE142	Engineering Mechanics (2)	BSE141	3	5	125	2	2	—	4	40	20	—	40	100	3	الميكانيكا الهندسية (2)	
MDE121	Production Technology	—	2	3	75	1	—	3	4	20	20	20	40	100	3	تكنولوجيا الإنتاج	
			Σ	18	28	700	13	7	4	24							

Level 2 (Sophomore)																	
Code	Course title	Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	اسم المقرر	
			Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark			
Semester (3)																	
—	Elective (3)	—	2	3	75	2	—	—	2	40	20	—	40	100	3	اختياري (3)	
MDE212	Mechanical Drawing with PC	MDE101	3	5	125	2	—	3	5	40	20	—	40	100	Project	الرسم الميكانيكي بالحاسب	
EPE211	Electrical Engineering	BSE122	3	3	75	2	—	3	5	40	20	—	40	100	3	هندسة كهربائية	
MDE221	Material Science	—	2	4	100	2	1	—	3	40	20	—	40	100	3	علم المواد	
MPE271	Thermodynamics	BSE122	2	4	100	2	1	—	3	40	20	—	40	100	3	ديناميكا حرارية	
ECE213	Computer Programming	—	3	4	100	2	—	3	5	40	20	—	40	100	3	البرمجة بالحاسب الآلي	
AUT211	Automotive Engineering Laboratories	18 C.H.	1	2	50	—	—	3	3	40	20	40	—	100	Oral	معامل هندسة السيارات	
ECE211	Electronic Engineering	BSE122	3	4	100	2	—	3	5	40	20	—	40	100	3	هندسة الكترونية	
			Σ	19	29	725	14	2	15	31							

Level 2 (Sophomore)																	
Code	Course title	Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	اسم المقرر	
			Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark			
Semester (4)																	
ECE212	Digital Systems Design	ECE211	3	5	125	2	—	3	5	40	20	—	40	100	3	تصميم الأنظمة الرقمية	
—	Elective (4)	—	3	4	100	2	2	—	4	40	20	—	40	100	3	اختياري (4)	
—	Elective (5)	—	3	4	100	2	2	—	4	40	20	—	40	100	3	اختياري (5)	
MPE213	Engineering Measurements	BSE122	3	5	125	2	—	3	5	40	20	—	40	100	3	قياسات هندسية	
MPE221	Fundamentals of Fluid Mechanics	BSE122	3	5	125	2	—	3	5	40	20	—	40	100	3	ميكانيكا الموائع	
AUT251	Vehicle Technology	AUT211	3	5	125	2	—	3	5	40	20	—	40	100	3	تكنولوجيا السيارات	
			Σ	18	28	700	12	4	12	28							

Level 3 (Junior)																	
Code	Course title	Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	أسم المقرر	
			Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark			
Semester (5)																	
EPE311	Electric Machines	EPE211	3	4	100	2	2	—	4	40	20	—	40	100	3	الات كهريهه	
MDE331	Mechanical Vibration	BSE142	3	4	100	2	2	—	4	40	20	—	40	100	3	اهتزازات ميكانيكية	
EPE312	Introduction to Power Electronics	ECE211	3	5	125	2	—	3	5	40	20	—	40	100	3	مقدمة في الكترولنيات القدرة	
MDE322	Stress Analysis	MDE221	3	4	100	2	2	—	4	40	20	—	40	100	3	تحليل اجهادات	
AUT321	Modeling and Simulation	BSE111	2	4	100	2	1	—	3	40	20	—	40	100	3	النمذجة والمحاكاة	
MPE331	Principles of Heat Transfer	MPE271	2	5	125	1	—	3	4	40	20	—	40	100	3	انتقال حرارة	
—	Elective (6)	—	3	5	125	2	2	—	4	40	20	—	40	100	3	اختياري (6)	
			∑	19	31	775	13	9	6	28							

Level 3 (Junior)																	
Code	Course title	Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	أسم المقرر	
			Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark			
Semester (6)																	
AUT323	Technical Report Writing	HUM111	2	4	100	2	—	—	2	40	20	—	40	100	3	كتابة التقارير الفنية	
AUT322	Mechatronics	MPE213	2	4	100	1	—	3	4	40	20	—	40	100	3	الميكاترونيات	
AUT324	Automatic Control	AUT321	3	5	125	2	2	—	4	40	20	—	40	100	3	تحكم الى	
MPE341	Internal Combustion Engines	MPE271	2	4	100	2	—	1	3	40	20	—	40	100	3	محركات الاحتراق الداخلي	
AUT341	Automotive Electrical Circuits and Systems	AUT251	3	5	125	2	—	3	5	40	20	—	40	100	3	المنظومات والدوائر الكهربائية بالسيارات	
AUT342	Electric and Hybrid Vehicle Technology	AUT251	3	5	125	2	—	3	5	40	20	—	40	100	3	تكنولوجيا السيارات الكهربائية والمهجنة	
AUT311	Field Training	75 C.H	—	2	50	—	—	6	6	60	0	—	40	100	Oral	تدريب ميداني	
—	Elective (7)	—	3	5	125	2	2	0	4	40	20	—	40	100	3	اختياري (6)	
			∑	18	34	850	13	4	16	33							

Level 4 (Senior)																
Course		Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	اسم المقرر
Code	Course title		Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark		
Semester (7)																
AUT421	Performance of Electric and Hybrid Vehicles	AUT251	3	5	125	2	2	—	4	40	20	—	40	100	3	أداء السيارات الكهربائية والمهجنة
AUT422	Vehicle Dynamics	MDE331	3	5	125	2	2	—	4	40	20	—	40	100	3	ديناميكا المركبات
AUT411	Automotive Fault Diagnosis	AUT251	3	5	125	2	—	3	5	40	20	—	40	100	3	تشخيص أعطال السيارات
ECE411	Microcontrollers	ECE213	3	5	125	2	—	3	5	40	20	—	40	100	3	المتحكمات الدقيقة
AUT401	Graduation Project (1)	100 C. H.	2	3	75	1	2	—	3	40	20	—	40	100	Oral	مشروع التخرج (1)
—	Elective (8)	—	3	5	125	2	2	—	4	40	20	—	40	100	3	اختياري (7)
			Σ	17	28	700	11	8	6	25						

Level 4 (Senior)																
Course		Pre-requisites	Weight			Weekly contact hours				Distribution of Marks					Exam duration in hours	اسم المقرر
Code	Course title		Credit hours	ECTS	SWL	Lectures	Tutorial	Labs.	Total cont. H.	Class Work	Mid-term Exam	Lab Exam	Final Exam	Total Mark		
Semester (8)																
AUT412	Automotive Maintenance	AUT411	3	5	125	2	—	3	5	40	20	—	40	100	3	صيانة السيارات
AUT423	Automotive Mechatronics Systems Design	AUT324 AUT422	3	5	125	2	2	—	4	40	20	—	40	100	3	تصميم منظومات التحكم بالسيارات
ECE412	Embedded Systems	ECE411	3	5	125	2	—	3	5	40	20	—	40	100	3	الأنظمة المدمجة
AUT431	Automotive Chassis Design	MDE32 2	3	5	125	2	2	—	4	40	20	—	40	100	3	تصميم الشاسية للسيارات
AUT402	Graduation Project (2)	AUT401	2	3	75	1	—	3	4	40	—	20	40	100	Oral	مشروع التخرج (2)
—	Elective (9)	—	3	5	125	2	2	0	4	40	20	—	40	100	3	اختياري (7)
			Σ	17	28	700	11	6	9	17						