

Curriculum for Associate Degree Program in Heavy Vehicles Mechanics Specialization

The curriculum of associate degree in “Heavy Vehicles Mechanics” specialization consists of (72 credit hours) as follows:

Serial No.	Requirements	Credit Hours
First	University Requirements	12
Second	Engineering Program Requirements	17
Third	Specialization Requirements	43
Total		72



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

**The curriculum of associate degree
in
Heavy Vehicles Mechanics Specialization**

First: University requirements (12 credit hours) as follows:

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
22001101	Arabic Language	3	3	-	
22002101	English Language	3	3	-	
21901100	Islamic Culture	3	3	-	
21702101	Computer Skills	3	1	4	
Total		12	10	4	

Second: Engineering program requirements (17 credit hours) as follow:

Course No	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20201111	Engineering Workshops	1	-	3	-
20204111	AutoCAD	2	-	6	-
20506111	Occupational Safety	2	2	-	-
21301111	General Mathematics	3	2	2	-
21302111	General Physics	3	2	2	-
21302112	General Physics Laboratory	1	-	3	-
21702111	Communication Skills and Technical Writing	3	2	2	22002101
20201121	Engineering Materials	2	2	-	-
Total		17	10	18	

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Third: Specialization Requirements (43 credit hours) as follows:

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20301111	Electricity and Electronics	2	2	0	21302111*
20301112	Electricity and electronics Laboratory	1	0	3	20301113*
20207121	Mechanics	3	3	0	21302111
20207111	Fluids and Hydraulic Machines	3	3		21302111*
20207112	Fluids and Hydraulic Machines Laboratory	1	0	3	20207111*
20209111	Thermal Engineering	3	3	0	21302111*
20209112	Thermal Engineering Laboratory	1	0	3	20209111*
20207131	Internal Combustion Engines	3	3	0	20209111
20207132	Internal Combustion Engines Laboratory	1	0	3	20207131*
20207141	Automobile Engineering	3	3	0	-
20207142	Automobile Engineering Workshop	1	0	3	20207141*
20205221	Diesel Engines	2	2	0	20209111
20205222	Diesel Engines Workshops	1	0	3	20205221*
20208211	Heavy duty Vehicles Transmission and Suspension Systems	2	2	0	20207121
20208212	Heavy duty Vehicles Transmission and Suspension Systems Workshops	1	0	3	20208211*
20210221	Automobile Electricity and Electronics	3	3	0	20403111 or 20301111
20210222	Automobile Electricity Laboratory	1	0	3	20210221*
20210223	Automobile Electronics Laboratory	1	0	3	20210221*
20207251	Automobile Diagnosis and Maintenance	3	3	0	20207141
20207252	Automobile Diagnosis and Maintenance Laboratory	1	0	3	20207251*
20208291	Training**	3	0	-	-
20208292	Project	3	0	-	-
Total		43	27	30	

*-Co-requisite

** Equivalent to 280 training hours

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Guiding Plan

First Year					
First Semester			Second Semester		
Course ID	Course Name	Credit Hours	Course ID	Course Name	Credit Hours
22001101	Arabic Language	3	20209111	Thermal engineering	3
21302111	General Physics	3	20209112	Thermal Engineering Lab	1
21302112	General Physics Lab	1	22002101	English Language	3
21702101	Computer Skills	3	20207121	Mechanics	3
21301111	General Mathematics	3	20204111	AutoCAD	2
20201111	Engineering Workshops	1	20506111	Occupational Safety	2
20207111	Fluids and Hydraulic Machines	3	20207141	Automobile Engineering	3
20207112	Fluids and Hydraulic Machines Lab.	1	20207142	Automobile Engineering Workshops	1
Total		18	Total		18

Second Year					
Third Semester			Fourth Semester		
Course ID	Course Name	Credit Hours	Course ID	Course Name	Credit Hours
20207131	Internal Combustion Engines	3	20207251	Automobile Diagnosis and Maintenance	3
20207132	Internal Combustion Engines Laboratory	1	20207252	Automobile Diagnosis and Maintenance Lab.	1
20205221	Diesel Engines	2	20208291	Training	3
20205222	Diesel Engines Workshops	1	20208292	Project	3
20210221	Automobile Electricity and Electronics	3	20208211	Heavy duty Vehicles Transmission and Suspension Systems	2
20301111	Electricity and Electronics	2	20208212	Heavy duty Vehicles Transmission and Suspension Systems Workshops	1
20301112	Electricity and electronics Lab.	1	21702111	Communication Skills and Technical Writing	3
21901100	Islamic Culture	3	20210222	Automobile Electricity Lab.	1
20201121	Engineering Materials	2	20210223	Automobile Electronics Lab.	1
Total		18	Total		18



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Brief Course Description

University Requirements

Course Title	Course No	Credit Hours (Theoretical /Practical)
Arabic Language	22001101	3 (3-0)
<p>تتضمن هذه المادة مجموعة من المهارات اللغوية بمستوياتها وأنظمتها المختلفة: الصوتية، والصرفية، والنحوية، والبلاغية، والمعجمية، والتعبيرية، وتشتمل نماذج من النصوص المشرقة: قرآنية، وشعرية، وقصصية، من بينها نماذج من الأدب الأردني؛ يتوخى من قراءتها وتدوقها وتحليلها تحليلاً أدبياً؛ تنمية الذوق الجمالي لدى الطلاب الدارسين.</p>		
English Language	22002101	3 (3-0)
<p>English 1 is a general course. It covers the syllabuses of listening, speaking, reading, writing, pronunciation and grammar, which are provided in a communicative context. The course is designed for foreign learners of the English language, who have had more than one year of English language study. The extension part would be dealt with in the class situation following the individual differences.</p>		
Islamic Culture	21901100	3 (3-0)
<ol style="list-style-type: none"> 1. تعريف الثقافة الإسلامية وبيان معانيها وموضوعاتها والنظم المتعلقة بها – وظائفها وأهدافها. 2. مصادر ومقومات الثقافة الإسلامية والأركان والأسس التي تقوم عليها. 3. خصائص الثقافة الإسلامية. 4. الإسلام والعلم، والعلاقة بين العلم والإيمان 5. التحديات التي تواجه الثقافة الإسلامية. 6. رد الشبهات التي تنثار حول الإسلام. 7. الأخلاق الإسلامية والآداب الشرعية في إطار الثقافة الإسلامية. 8. النظم الإسلامية. 		
Computer Skills	21702101	3 (1-4)
<p>An introduction to computing and the broad field of information technology is given. Topics covered include the basic structure of digital computer system, microcomputer, operating systems, application software, data communication and networks, and the internet. Hands-on learning emphasizes Windows xp, MS-office2000, and the internet.</p>		

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Engineering Program requirements

Engineering Workshops	20201111	1 (0-3)
Development of basic manual skills in Mechanical and Electrical works. Use of manual tools and measuring devices. Hand filing, welding, metal cutting and forming. Electrical wiring.		
AutoCAD	20204111	2 (0-6)
Introduction to AutoCAD, application of AutoCAD, commands, geometric entities. Geometric construction. Dimensioning, free –hand sketching, object representation, orthographic drawing and projections.		
Occupational safety	20506111	2 (2-0)
Role of technicians in economic development First aid accident prevention. Protective devices and equipment. Industrial safety standards. Nature of fire hazards. Sand fire regulations. Physiological effects of electrical shock on human body. First aid and treatment for the effects of electric shock. Rules of spare and chemicals storage and handing.		
Communication Skills and Technical Writing	21702111	3 (2-2)
The main goal of this course is to equip the students with the necessary communication skills in everyday life & work situations and improve their abilities in technical writing to meet market needs. For this course, the English language is the language of teaching & the means of communication for all classroom situations.		
Engineering Materials	20201121	2 (2-0)
Definition of engineering materials. Classification of materials and their properties. Metallic and non-metallic materials. Metals, alloys and composite materials. Conductors, insulators and semiconductors. Mechanical, Magnetic, Thermal and electrical characteristics of materials. Industrial applications of different types of materials.		
General Mathematics	21301111	3 (2-2)
Real numbers coordinate planes, lines, distance and circles. Functions: (operations and graphs on functions), limits, continuity, limits and continuity of trigonometric functions. Exponential and logarithmic functions. Differentiation (techniques of differentiation, chain rule, implicit differentiation). Application of differentiation (increase, decrease, concavity). Graphs of polynomials. Applications: Rolle's Theorem and Mean-Value Theorem, Integration (by substitution, definite integral, fundamental theorem of Calculus). Application of definite integral (area between two curves, volumes)		
General Physics	21302111	3 (2-2)
Physics and measurement, motion in one dimension, vectors, laws of motion, circular motion, energy and energy transfer, potential energy, linear momentum and collisions, electric fields, Gauss's law, electric potential, capacitance and dielectrics, current and resistance, direct current circuits, magnetic fields, sources of the magnetic field, and Faraday's law of electromagnetic induction.		
General Physics lab	21302112	1 (0-3)
In this course, the student performs thirteen experiments in mechanics and in electricity.		

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Specialization Requirements

Electricity and Electronics	20301111	2 (2-0)
Concepts and definitions, electrical circuit elements, voltage, current, resistance, capacitance and inductance, ohms law and dc circuit Calculations. Ac Circuits. Three phase circuits, transformers, and electrical machines. Basic electronic devices and circuits. Introduction to electrical protection.		
Electricity and Electronics Lab.	20301112	1 (0-3)
DC and AC circuits. Current and voltage measurements. Simple electronic circuits. DC and AC machines. Single-phase transformers. Protection devices and circuits.		
Mechanics	20207121	3 (3-0)
Basic definitions and concepts. SI units. Equilibrium. Free body diagrams. Simple structural analysis. Internal forces. Friction. Moment of inertia. Kinematics of particles.		
Fluids and Hydraulic Machines	20207111	3 (3-0)
Fluid properties, fluid static's, fluid motion, continuity equation, momentum principle, energy principle, Fluid flow in pipes, pipe friction, introduction to Pumps, Types, Selection and application of pumps.		
Fluids and Hydraulic Machines Lab.	20207112	1 (0-3)
Measuring of physical properties of fluids, force on immersed plate, Jet force on plate, Bernoullis equation, Reynolds experiments, flow through orifices, and nozzle venture friction factor.		
Thermal Engineering	20209111	3 (3-0)
Concepts and definitions, Properties of a pure substance, Work and heat, the first law of thermodynamics, the second law of thermodynamics, Principles of heat transfer Steady state conduction, Radiation, Heat exchangers		
Thermal Engineering Lab.	20209112	1 (0-3)
Pressure – Temperature relation in the saturation region; Compressor cycles and analyses; Heat pump performance; Conduction heat transfer; Radiation heat transfer; and Heat exchanger performance		
Internal Combustion Engines	20207131	3 (3-0)
Definition and introduction to the (ICE) fundamentals of engine, operation engine types and classification, engine construction, engine measurements and performance, engine system (lubrication, cooling, fuel) Including both carburetor and electronic fuel injection system .		
Internal Combustion Engines Lab.	20207132	1 (0-3)
Performance tests for spark and compression engines, air and fuel consumption, air fuel ratio bake and indicated horse power. Specific fuel consumption, volumetric efficiency energy balance, variable compression ratio rest engine emission, diagnostic, adjustment of engine.		

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Diesel Engines	20205221	2 (2-0)
Introduction, specifications, components & types of heavy-duty diesel engines, two stroke, four stroke, water cooled, air-cooled, shape in line cylinders, v-shape (6-v, 8-v, 12-v) cylinders, fuel systems air supplies systems, exhaust systems, lubrication systems, tuning & adjusting, applications on armor vehicles engine.		
Diesel Engines Workshops	20205222	1 (0-3)
Practicing on armor vehicle engines ,stating on the vehicles & switching it off dismantling the power pack off the vehicle & mounting it back, recognizing the external & internal components disassembling the engines and assembling it, following the systems on the engine, practicing tuning & adjustment practicing, preventive maintenance		
Heavy duty Vehicles Transmission and Suspension Systems	20208211	2 (2-0)
Introduction types of gears planetary gear sets and its laws fluid couplings & torque converters clutches for planetary gear sets engagement automatic transmission integrated gear boxes: power transmission steering – braking in on unit hydraulic circuits controlling gear boxes lubrication system troubleshooting. Suspension systems for heavy –duty vehicles: components types of suspension, trouble shooting.		
Heavy duty Vehicles Transmission and Suspension Systems Workshops	20208212	1 (0-3)
Practicing on transmission & suspension systems for different types of heavy duty vehicles (tanks): disassembling the transmission units and assembling it back, troubleshooting & repairs, applying preventive maintenance, disassembling the different components of suspension units and assembling it back, charging with Nitrogen and oil troubleshooting & repairs, applying.		
Automobile Engineering	20207141	3 (3-0)
Introduction of fundamentals of engine construction and operation, engine systems, automotive transmission (manual and automatic), suspension system, wheel alignment, automotive brake system, steering system, automotive electric and electronic systems.		
Automobile Engineering Workshops	20207142	1 (0-3)
Personal safety, automotive workshop safety area Universal hand tools and equipments, special tools used in automotive workshop, car's units disassembly / assembly and adjustments.		

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Automobile Electricity and Electronics	20210221	3 (3-0)
Introduction, battery, starting system, charging system, ignition system, electronic fuel injection system, lights, safety and signaling, driver information and control devises, wiring harnesses, instrument panel, (CANbus) technology for automotive application.		
Automobile Electricity Lab.	20210222	1 (0-3)
Battery testing, Starting system, Diagnostics and maintenance, Ignition systems, Diagnostics and maintenance Lights, Safety and Signaling, Automotive, generators automatic control system.		
Automobile Electronics Lab.	20210223	1 (0-3)
Testing and inspection of sensors, actuators, relays. Electronic systems in modern cars: Ignition, fuel, ...		
Automobile Diagnosis and Maintenance	20207251	3 (3-0)
Introduction to automotive diagnostics, maintenance and repair, theoretical background about automotive diagnostics, maintenance and repair, types of automotive diagnostics, maintenance and repair, types of automotive maintenance Inspection and service of car components: engine, engine system, transmission, broke system, suspension system, steering		
Automobile Diagnosis and Maintenance Lab.	20207252	1 (0-3)
Equipments and devices for automotive diagnosis, maintenance repair personal skills in performing inspection and service of cars .Components: engine, transmission, brake system, steering system, suspension system, suspension system and electrical equipments.		
Training	20208291	3 (280 training hours)
Equivalent to (280 hours) of field training targeted to emphasize the ability of students to apply the theories in the real world of the profession.		
Project	20208292	3
An integrated assembly/design practical work related to the major fields of study.		