

# Curriculum for Associate Degree Program in Autotronics of Heavy Vehicles Specialization

The curriculum of associate degree program in “Autotronics of Heavy Vehicles” 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



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**The curriculum of associate degree in  
Autotronics of Heavy Vehicles 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	
<b>Total</b>		<b>12</b>	<b>10</b>	<b>4</b>	

**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	-	-
<b>Total</b>		<b>17</b>	<b>10</b>	<b>18</b>	

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

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20301113	Electrical Circuits	3	3	-	21302111*
20301114	Electrical Circuits Lab	1	-	3	20301113*
20403111	Electronics	3	3	-	20301113*
20403112	Electronics Lab	1	-	3	20403111*
20404121	Digital Fundamentals	2	2	-	20403111
20404122	Digital Fundamentals Laboratory	1	-	3	20404121*
20304241	Protection and Control Devices	2	2	-	-
20304242	Protection and Control Devices Laboratory	1	0	3	20304241*
20304111	Electrical Machines	3	3	0	20301113
20304114	Electrical Machines Laboratory	1	0	3	20304111* or 20304113*
20301131	Engineering Software	1	0	3	21702101
20402211	Heavy Vehicles Hull Electrical Systems	3	3	0	20304111
20402212	Heavy Vehicles Hull Electrical Systems Workshops	2	0	6	20402211*
20402221	Heavy Vehicles Turrets Electronic Systems	3	3	0	20403111
20402222	Heavy Vehicles Turrets Electronic Systems Workshops	2	0	6	20402221*
20402231	Special Electronic Equipment	3	3	0	20404121
20402232	Special Electronic Equipment Workshops	1	0	3	20402231*
20402213	Automotive Electrical systems	3	3	0	20301113
20402214	Automotive Electrical Systems Workshops	1	0	3	20402213*
20402291	Training**	3	-	-	-
20402292	Project	3	-	-	-
<b>Total</b>		<b>43</b>	<b>25</b>	<b>36</b>	

\* 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
22002101	English Language	3	22001101	Arabic Language	3
21702101	Computer Skills	3	20204111	AutoCAD	2
20201111	Engineering Workshops	1	20506111	Occupational Safety	2
21301111	General Mathematics	3	20201121	Engineering Materials	2
21302111	General Physics	3	20301113	Electrical Circuits	3
21302112	General Physics Lab.	1	20301114	Electrical circuits Lab.	1
20403111	Electronics	3	20404121	Digital Fundamentals	2
20403112	Electronics Lab.	1	21901100	Islamic Culture	3
<b>Total</b>		<b>18</b>	<b>Total</b>		<b>18</b>

Second Year					
Third Semester			Fourth Semester		
Course ID	Course Name	Credit Hours	Course ID	Course Name	Credit Hours
20304241	Protection and Control Devices	2	20402213	Automotive Electrical systems	3
20304242	Protection and Control Devices Lab.	1	20402214	Automotive Electrical systems Workshops	1
20402211	Heavy Vehicles Hull Electrical Systems	3	21702111	Communication Skills and Technical Writing	3
20402212	Heavy Vehicles Hull Electrical Systems Workshops	2	20402291	Training	3
20402231	Special Electronic Equipment	3	20402292	Project	3
20402232	Special Electronic Equipment Workshops	1	20402221	Heavy Vehicles Turrets Electronic Systems	3
20404122	Digital fundamentals Lab.	1	20402222	Heavy Vehicles Turrets Electronic Systems Workshops	2
20304111	Electrical Machines	3			
20304114	Electrical Machines Lab.	1			
20301131	Engineering Software	1			
<b>Total</b>		<b>18</b>	<b>Total</b>		<b>18</b>

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## Brief Course Description

## University Requirements

Course Title	Course No	Credit Hours ( Theoretical /Practical)
<b>Arabic Language</b>	<b>22001101</b>	<b>3 (3-0)</b>
<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>		
<b>English Language</b>	<b>22002101</b>	<b>3 (3-0)</b>
<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>		
<b>Islamic Culture</b>	<b>21901100</b>	<b>3 (3-0)</b>
<ol style="list-style-type: none"> <li>1. تعريف الثقافة الإسلامية وبيان معانيها وموضوعاتها والنظم المتعلقة بها - وظائفها وأهدافها.</li> <li>2. مصادر ومقومات الثقافة الإسلامية والأركان والأسس التي تقوم عليها.</li> <li>3. خصائص الثقافة الإسلامية.</li> <li>4. الإسلام والعلم، والعلاقة بين العلم والإيمان</li> <li>5. التحديات التي تواجه الثقافة الإسلامية.</li> <li>6. رد الشبهات التي تثار حول الإسلام.</li> <li>7. الأخلاق الإسلامية والآداب الشرعية في إطار الثقافة الإسلامية.</li> <li>8. النظم الإسلامية.</li> </ol>		
<b>Computer Skills</b>	<b>21702101</b>	<b>3 (1-4)</b>
<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**

<b>Engineering Workshops</b>	<b>20201111</b>	<b>1 (0-3)</b>
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.		
<b>AutoCAD</b>	<b>20204111</b>	<b>2 (0-6)</b>
Introduction to AutoCAD, application of AutoCAD, commands, geometric entities. Geometric construction. Dimensioning, free –hand sketching, object representation, orthographic drawing and projections.		
<b>Occupational safety</b>	<b>20506111</b>	<b>2 (2-0)</b>
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.		
<b>Communication Skills and Technical Writing</b>	<b>21702111</b>	<b>3 (2-2)</b>
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.		
<b>Engineering Materials</b>	<b>20201121</b>	<b>2 (2-0)</b>
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.		
<b>General Mathematics</b>	<b>21301111</b>	<b>3 (2-2)</b>
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)		
<b>General Physics</b>	<b>21302111</b>	<b>3 (2-2)</b>
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.		
<b>General Physics lab</b>	<b>21302112</b>	<b>1 (0-3)</b>
In this course, the student performs thirteen experiments in mechanics and in electricity.		

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**Specialization Requirements**

<b>Electrical Circuits</b>	<b>20301113</b>	<b>3 (3-0)</b>
Voltage, Current, and Resistance, Ohm's Law, Energy and Power, Series-Parallel Circuits, Introduction to Alternating Current and Voltage, Capacitors, Inductors, RLC Circuits and Resonance. Electrical Measurements.		
<b>Electrical Circuits Lab.</b>	<b>20301114</b>	<b>1 (1-3)</b>
DC and AC circuits. Resonance. Measuring devices.		
<b>Electronics</b>	<b>20403111</b>	<b>3 (3-0)</b>
Semiconductor devices. Diodes: classification, characteristics and applications. Transistors: classification, characteristics and applications. Amplifiers. Oscillators. Logic gates and Integrated circuits: Basic functions, symbols and applications. Introduction to electronic measurements: Oscilloscope applications.		
<b>Electronics Lab.</b>	<b>20403112</b>	<b>3 (0-3)</b>
Use of oscilloscope in measurements. Investigation of characteristics of semiconductor devices. Construction and study of electronic circuits. Experiments in electronics have to cover the main electronic devices (diode, zener diode, diode applications, BJT, FET, op – amp, oscillator, SCR).		
<b>Digital Fundamentals</b>	<b>20404121</b>	<b>2 (2-0)</b>
Numerical systems, operations, and codes, logic gates, Boolean algebra and logic simplification, combinational logic and function of combinational logic, flip – flops, counters, shift registers. Fixed – function Integrated Circuits, and Programmable Logic Devices ( PLDs ).		
<b>Digital Fundamentals Lab.</b>	<b>20404122</b>	<b>1 (0-3)</b>
Experiments in digital fundamentals have to cover logic gates, combinational logic, flip – flops, counters, shift registers.		
<b>Protection and Control Devices</b>	<b>20304241</b>	<b>2 (2-0)</b>
The target of the course is to give the student the basic information and skills related to the most common control and protection devices ,The student shall gain the experience of selection and wiring and troubleshooting different control and protection devices such as fuses, circuit breakers , relay ,contactors ,and switches.		
<b>Protection and Control Devices Lab.</b>	<b>20304242</b>	<b>1 (0-3)</b>
The course aims at giving the students practical skills in order to select ,wire troubleshoot and maintain the most common control and protection devices like fuses ,circuit breakers , relays ,contactors ,timers ,switches ,and measuring transformers.		
<b>Electrical Machines</b>	<b>20304111</b>	<b>3 (3-0)</b>
This course throws light on all types of electrical machines ,transformers ,motors ,generators ,special machines ,These machines which may face a diploma holder in his practical life ,He must be aware of many related things about these machines ,construction ,principles of operation , characteristics , applications , maintenance .		

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<b>Electrical Machines Lab.</b>	<b>20304114</b>	<b>1 (0-3)</b>
This course focus ,on connection of various types of electrical machines , measurement of losses and efficiency ,speed control and mechanical characteristics of types of motors ,external characteristics of generators.		
<b>Engineering Software</b>	<b>20301131</b>	<b>1 (0-3)</b>
Automated electrical engineering drawing using computer graphic packages. Electrical block and wiring diagrams symbols of basic elements of electrical and electronic circuits, devices and machines. Block diagram of electrical & electronic systems. Schemes reading.		
<b>Heavy Vehicles Hull Electrical Systems</b>	<b>20402211</b>	<b>3 (3-0)</b>
It is a full understanding of all the electrical systems used in Heavy Vehicles. Main and Generating Engine Starter Systems , Power Distribution , Charging System , Driver Instrument Panel Indicating & Warning Lights – Fuel Pumps – Fuel Cut – off Solenoid – Fuel Gauge , Engine Management System , Pump Mounted Equipment , Inlet Manifold Heater , Main Engine Control Unit		
<b>Heavy Vehicles Hull Electrical Systems Workshops</b>	<b>20402212</b>	<b>2 (0-6)</b>
Fault finding practical exercises on all electrical systems using related schematic diagrams besides practical application for all subjects studied theoretically		
<b>Heavy Vehicles Turrets Electronic Systems</b>	<b>20402221</b>	<b>3 (3-0)</b>
Thorough Study for the Functions, Operation and also The Purpose Of The Turret Electronic Systems: Computer Interface Unit, Data Handling Sub-System, Fire Control System, The Sensor Sub-System, The Sight Sub-System , Gun Control Equipment , Thermal Observation Gunnery Sight		
<b>Heavy Vehicles Turrets Electronic Systems Workshops</b>	<b>20402222</b>	<b>2 (0-6)</b>
Systematic fault finding and troubleshooting, practical application for all subjects studied theoretically		
<b>Special Electronic Equipment</b>	<b>20402231</b>	<b>3 (3-0)</b>
Typical various electronic equipment, Artillery target acquisition system, night vision sight, laser range finder, LP6 navigation systems (pads) ceraco radar, progetile velocity measurement Milcam and Ranger systems		

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<b>Special Electronic Equipment Workshops</b>	<b>20402232</b>	<b>1 (0-3)</b>
Adjustment and calibration for the related systems in addition to practical application on all subjects studied theoretically		
<b>Automotive Electrical Systems</b>	<b>20402213</b>	<b>3 (3-0)</b>
Basic electricity and electronics, automotive batteries, starting system fundamentals, charging system fundamentals, ignition system fundamentals. Light wipers, horn fundamentals, heating and air conditioning fundamentals, radios, power options		
<b>Automotive Electrical Systems Workshops</b>	<b>20402214</b>	<b>1 (0-3)</b>
Battery testing and servicing, starting system testing and repair charging system diagnosis testing, repair, ignition system problems testing and repair, heating and condition service		
<b>Training</b>	<b>20402291</b>	<b>3 (280 training hours)</b>
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.		
<b>Project</b>	<b>20402292</b>	<b>3</b>
An integrated assembly/design practical work related to the major fields of study.		

