

## Curriculum for Associate Degree Program in Electro-hydraulic Systems Specialization

The curriculum of associate degree in “Electro-hydraulic Systems” 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
<b>Total</b>		<b>72</b>



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**The curriculum of associate degree in  
Electro-hydraulic Systems 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 Laboratory	1	-	3	20403111*
20404121	Digital Fundamentals	2	2	-	20403111
20404122	Digital Fundamentals Laboratory	1	-	3	20404121*
20207111	Fluids and Hydraulic Machines	3	3	-	21302111*
20207112	Fluids and Hydraulic Machines Laboratory	1	-	3	20207111*
20311211	Electro-Hydraulic Systems 1	3	3	0	20207111
20311212	Electro-Hydraulic Systems 1 Workshops	1	0	3	20311211*
20311213	Electro-Hydraulic Systems 2	3	3	0	20311211
20311214	Electro-Hydraulic Systems 2 Workshops	2	0	6	20311213*
20311215	Industrial Applications of Hydraulic Systems	2	2	0	20311211*
20311216	Industrial Applications of Hydraulic Systems Workshops	2	0	6	20311215*
20311217	Troubleshooting of Hydraulic Systems	3	3	0	20311213*
20311218	Troubleshooting of Hydraulic Systems Workshops	2	0	6	20311217*
20304111	Electrical Machines	3	3	0	20301113
20304114	Electrical Machines Lab.	1	0	3	20304111* or 20304113*
20311291	Training**	3	-	-	-
20311292	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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Study Plan for Associate Degree

in  
Electro-hydraulic Systems Specialization

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	21702111	Communication Skills and Technical Writing	3
			20207111	Fluids and Hydraulic Machines	3
21301111	General Mathematics	3	20201111	Engineering Workshops	1
21302111	General Physics	3	20301113	Electrical Circuits	3
21302112	General Physics Lab.	1	20301114	Electrical circuits Lab.	1
21901100	Islamic Culture	3	20403111	Electronics	3
20201121	Engineering Materials	2	20403112	Electronics Lab.	1
<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
20304111	Electrical Machines	3	203112213	Electro-Hydraulic Systems 2	3
20304114	Electrical Machines Lab.	1	20311214	Electro-Hydraulic Systems 2 Workshops	2
20311211	Electro-Hydraulic Systems 1	3	20311217	Troubleshooting of Hydraulic Systems	3
20411212	Electro-Hydraulic Systems 1 Workshops	1	20311218	Troubleshooting of Hydraulic Systems Workshops	2
20204111	AutoCAD	2	20311216	Industrial Applications of Hydraulic systems Workshops	2
20506111	Occupational Safety	2			
20207112	Fluids and Hydraulic Machines Lab.	1			
20311215	Industrial Applications of Hydraulic systems	2	20311291	Training	3
20404121	Digital Fundamentals	2			
20404122	Digital fundamentals Lab.	1			
			20311292	Project	3
<b>Total</b>		<b>12</b>	<b>Total</b>		<b>16</b>

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## 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 المشرفة: 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>Fluids and Hydraulic Machines</b>	<b>20207111</b>	<b>3 (3-0)</b>
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.		
<b>Fluids and Hydraulic Machines Lab.</b>	<b>20207112</b>	<b>1 (0-3)</b>
Measuring of physical properties of fluids, force on immersed plate, Jet force on plate, Bernoulli's equation, Reynolds experiments, flow through orifices, and nozzle venture friction factor.		
<b>Electro-hydraulic Systems 1</b>	<b>20311211</b>	<b>3 (3-0)</b>
Electro-hydraulic circuit, function, components, diagrams defect inspection for hydraulic systems used in artillery vehicles		

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<b>Electro-hydraulic Systems 1 Workshops</b>	<b>20311212</b>	<b>1 (0-3)</b>
Practicing on Assembly disassembling and testing of the main component of the electro-hydraulic systems used in artillery for controlling the movement of the turret and cannon		
<b>Electro-hydraulic Systems 2</b>	<b>20311213</b>	<b>3 (3-0)</b>
Practicing on, assembling disassembling and testing on the main component of the electro hydraulic system used in tanks for controlling the movement of the torrent and cannon		
<b>Electro-hydraulic Systems 2 Workshops</b>	<b>20311214</b>	<b>2 (0-6)</b>
Practicing on assembling disassembling and testing of the main component of the electro – hydraulic systems in tanks for controlling the movement of the turret and cannon		
<b>Industrial Applications of Hydraulic Systems</b>	<b>20311215</b>	<b>2 (2-0)</b>
Hydrostatic system, torque converter, hydraulic transmission, track treat or hydraulic systems, recovery vehicles hydraulic systems, hydraulic diagrams of theses systems, functions and defect diagnoses		
<b>Industrial Applications of Hydraulic Systems Workshops</b>	<b>20311216</b>	<b>2 (0-6)</b>
Practicing on, Assembling disassembling and testing of the main components of hydraulic systems in the industrial vehicles such as hydraulic cranes, track tractors, hydraulic systems and hydraulic transmission		
<b>Troubleshooting of Hydraulic Systems</b>	<b>20311217</b>	<b>3 (3-0)</b>
Basic and troubleshooting of hydraulic system , symbols and circuited and components pumps , oils , valves , actuators , filters , reservoirs , tubing , accumulators , circuits hydraulic systems		
<b>Troubleshooting of Hydraulic Systems Workshops</b>	<b>20311218</b>	<b>2 (0-6)</b>
Practicing on the hydraulic systems recognizing and disassembling: pumps, actuator, filter, control valves, pressure valves, flow metering valves		
<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>Training</b>	<b>20311291</b>	<b>3 (280 training hours)</b>
Equivalent to (140 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>20311292</b>	<b>3</b>
An integrated assembly/design practical work related to the major fields of study.		

