

## Curriculum for Associate Degree Program in Automatic Control Technology Specialization

The curriculum of associate degree in “Automatic Control Technology” 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>



**The curriculum of associate degree in  
Automatic Control Technology 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	21302111*
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>	

\* Co-requisite

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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*
20310111	Security and Alarm Systems	2	1	3	20301113
20310221	Power Electronics and Electrical Drive	3	3	-	20403111
20310222	Power Electronics and Electrical Drive Lab.	1	-	3	20310222*
20310243	SCADA Practice	2	1	3	20310241*
20308211	Transducers	3	3	-	20404121
20308212	Transducers Laboratory	1	-	3	20308211*
20310231	Programmable Logic Controllers Programming and Applications	2	2	-	20404121
20310232	Programmable Logic Controllers Programming and Applications Lab.	1	-	3	20310231*
20310241	Process Control Systems	2	2	-	
20310242	Process Control Systems Lab.	1	-	3	20310241*
20310251	Electro-Pneumatic and Hydraulic Systems	3	3	-	
20310252	Electro-Pneumatic and Hydraulic Systems Lab.	1	-	3	20310251*
20409221	Microprocessor Practice	2	1	3	20404121
20409111	Industrial Supervision	2	2	-	20506111
20310291	Training**	3	-	-	-
20310292	Project	3	-	-	-
<b>Total</b>		<b>43</b>	<b>26</b>	<b>33</b>	

\* Co-requisite

\*\* Equivalent to 280 training hours



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**Study Plan for Associate Degree  
in  
Automatic Control Technology 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	20204111	AutoCAD	2
20506111	Occupational Safety	2	20201111	Engineering Workshops	1
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
21901100	Islamic Culture	3	20403111	Electronics	3
			20403112	Electronics Lab.	1
			20404121	Digital Fundamentals	2
<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
20404122	Digital Fundamentals Lab.	1	20310231	Programmable Logic Controllers Programming and applications	2
20308211	Transducers	3	20310232	Programmable Logic Controllers Programming and applications Lab.	1
20308212	Transducers Lab.	1	20310243	SCADA Practice	2
20310221	Power Electronics and Electrical Drive	3	20310251	Electro-Pneumatic and Hydraulic Systems	3
20310222	Power Electronics and Electrical Drive Lab.	1	20310252	Electro-Pneumatic and Hydraulic Systems Lab.	1
20310111	Security and Alarm Systems	2	21702111	Communication skills and Technical writing	3
20409111	Industrial Supervision	2	20310291	Training	3
20409221	Microprocessor Practice	2	20310292	Project	3
20310241	Process Control Systems	2			
20310242	Process Control Systems Lab.	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.		

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<b>General Physics lab</b>	<b>21302112</b>	<b>1 (0-3)</b>
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In this course, the student performs thirteen experiments in mechanics and in electricity.

### Specialization Requirements

<b>Electrical Circuits</b>	<b>20301113</b>	<b>3 (3-0)</b>
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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>20301112</b>	<b>1 (0-3)</b>
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DC and AC circuits. Resonance. Measuring devices.

<b>Electronics</b>	<b>20403111</b>	<b>3 (3-0)</b>
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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>1 (0-3)</b>
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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>
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Study of numerical systems, theory of Boolean algebra and logic circuits, applications to different types of circuits, study of flip-flops, counters, registers and accumulators, digital system memory including ROM, RAM, and EPROM.

<b>Digital Fundamentals Lab.</b>	<b>20404122</b>	<b>1 (0-3)</b>
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Testing and troubleshooting instruments, Logic circuits, adders, comparators, encoders and decoders, flip-flops, counters, registers, memories RAM, ROM, EPROM.

<b>Security and alarm systems</b>	<b>20310111</b>	<b>2 (1-3)</b>
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This subject treats application related to security system in building, fire detection systems, local and central fire detection system, Fire detectors, installing, fire alarm system, monitoring and security system

<b>Power Electronics and Electrical Drive</b>	<b>20310221</b>	<b>3 (3-0)</b>
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This course deals with power electronics circuit (diodes, transistors, triac, thyristors AC voltage control, application to control system and mechanical power transmission, open loop motor speed control

<b>Power Electronics and Electrical Drive Lab.</b>	<b>20310222</b>	<b>1 (0-3)</b>
Lab in support of the power semiconductors devices and electric motor drive system .		
<b>SCADA Practice</b>	<b>20310243</b>	<b>2 (1-3)</b>
At such, it is a purely .software package that is positioned on top of hardware to which it is interfaced, in general via programmable logic controllers (PLCs), or other commercial hardware modules		
<b>Transducers</b>	<b>20308211</b>	<b>3 (3-0)</b>
The course is intended to give the students the theoretical and technological experience related to different types of transducers used for measurement and control. The course classifies transducers and gives the principles of functioning and application of pressure, displacement, strain, flow temperature and level transducers		
<b>Transducers Lab.</b>	<b>20308212</b>	<b>1 (0-3)</b>
At conclusion of the laboratory course, the student shall be able to select, wire or tube, calibrate and specify a wide range of different industrial transducers. The student will be able to carry out troubleshooting and elementary modification to that range of transducer		
<b>Programmable Logic Controllers Programming and Applications</b>	<b>20310231</b>	<b>2 (2-0)</b>
Basic function and application of PLC. Provides practice skills and knowledge on the PLC structure, interfacing with real industrial processor. Programming PLC using ladder diagrams and statements list. Trouble shooting PLC system program		
<b>Programmable Logic Controllers Programming and Applications Lab.</b>	<b>20310232</b>	<b>1 (0-3)</b>
Practical study that supports the theoretical material. This student shall be able to design required programs transfer or install in the PLC and after debugging to run it or modify it if necessary , practical exercises shall include time driven types. The student shall realize different sequences using looping techniques by means of different timers, counters, internal detect duty cycle functions		
<b>Process Control Systems</b>	<b>20310241</b>	<b>2 (2-0)</b>
This subject covers the application of instrumentation in process industry introduced different quantities to be controlled like (pressure, temperature, level, flow), analog(electronics and pneumatics) and digital control device		
<b>Process Control Systems Lab.</b>	<b>20310242</b>	<b>1 (0-3)</b>
Lab in support of the control loop system, experiments to true different controllers analog (electronics and pneumatics) and digital to control pressure, flow, level, temperature, using mat lab .		

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<b>Electro-Pneumatic and Hydraulic Systems</b>	<b>20310251</b>	<b>3 (3-0)</b>
Introduction to fluid mechanics. Properties of hydraulics and pneumatics. Components of pneumatic and hydraulic systems , symbols and schematic diagrams, design circuits, electro control drive, proportional valves, troubleshooting systems and components).		
<b>Electro-Pneumatic and Hydraulic Systems Lab.</b>	<b>20310252</b>	<b>1 (0-3)</b>
The course covers the major activities related to industrial pneumatic and hydraulic drives such as actuator positioning, wiring practice on plc control board and application, proportional control device, maintenances the hydraulics and pneumatics system		
<b>Microprocessor Practice</b>	<b>20409221</b>	<b>2 (1-3)</b>
Microprocessor architecture, memories ,basic registers, assembly language or C, interrupters, seven segment, liquid crystal display, dot matrix, applications and simulation		
<b>Industrial Supervision</b>	<b>20409111</b>	<b>2 (2-0)</b>
Supervision duties training knowledge job, introduction job standards, job analysis, training needs study, training programs and curriculum, training evaluation, subordinates appraisal, job organization, production order form filling.		
<b>Training</b>	<b>20310291</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>20310292</b>	<b>3</b>
An integrated assembly/design practical work related to the major fields of study.		