

Curriculum for Associate Degree Program in Welding Technology Specialization

The curriculum of associate degree in “Welding Technology” 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



**The curriculum of associate degree
in
Welding 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	
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	

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

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
20203121	Methods of Measurements	2	2	0	
20203122	Methods of Measurements Lab.	1	0	3	20203121*
20204121	Strength of Materials	2	2	0	20207121
20204122	Strength of Materials Laboratory	1	0	3	20204121*
20209111	Thermal Engineering	3	3	0	21302111*
20209112	Thermal Engineering Laboratory	1	0	3	20209111*
20204211	Mechanical Drawing	2	0	6	20204111
20202111	Manufacturing Processes 1	2	2	0	
20202112	Manufacturing Processes 1 Workshops	1	0	3	20202111*
20202211	Manufacturing Processes 2	2	2	0	20202111
20202212	Manufacturing Processes 2 Workshops	1	0	3	20202211*
20203111	Welding Technology 1	2	2	0	
20203112	Welding Technology 1 Workshops	1	0	3	20203111*
20203213	Welding Technology 2	3	3	0	20203111
20203214	Welding Technology 2 Workshops	1	0	3	20203213*
20203215	Reclamation by welding	2	2	0	20203213*
20203216	Reclamation by Welding Workshops	1	0	3	20203215*
20201271	Metallurgical Heat Treatment	2	2	0	20209111
20201272	Metallurgical Heat Treatment Laboratory	1	0	3	20201271*
20203291	Training**	3	0	-	-
20203292	Project	3	0	-	-
Total		43	25	36	

*-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
20201121	Engineering Materials	2	20506111	Occupational Safety	2
21901100	Islamic Culture	3	20201111	Engineering Workshops	1
			20202111	Manufacturing Processes 1	2
			20202112	Manufacturing Processes 1 Workshops	1
Total		18	Total		18

Second Year					
Third Semester			Fourth Semester		
Course ID	Course Name	Credit Hours	Course ID	Course Name	Credit Hours
20204121	Strength of Materials	2	20203213	Welding Technology 2	3
20203121	Methods of Measurements	2	20203214	Welding Technology 2 Workshops	1
20203122	Methods of Measurements Lab.	1	20203215	Reclamation by Welding	2
20202211	Manufacturing Processes 2	2	20203216	Reclamation by Welding Workshops	1
20202212	Manufacturing Processes 2 Workshops	1	20203291	Training	3
20203111	Welding Technology 1	2	20203292	Project	3
20203112	Welding Technology 1 Workshops	1	20301111	Electricity and Electronics	2
21702111	Communication Skills and Technical Writing	3	20301112	Electricity and electronics Lab	1
20201271	Metallurgical Heat Treatment	2	20204211	Mechanical Drawing	2
20204212	Strength of Materials Lab.	1			
20201272	Metallurgical Heat Treatment Lab.	1			
Total		18	Total		18

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Brief Course Description for Associate Degree in Engineering Program Specializations 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 تثار 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)
The physical concepts to be studied includes: vectors, motion in one dimension, motion in two dimensions, the laws of motion, applications of Newton's laws, circular motion, energy and energy transfer, potential energy, linear momentum, electricity, electrical potential, capacitance, current and resistance .		
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.		
Strength of Materials	20204121	2 (2-0)
Principles of static including equilibrium and static equivalence, determination of moment and force resultants in slender members, introduction to mechanics of deformable bodies, concept of stress and strain, classification of material behavior, stress-strain relations and generalized Hook's law, application to engineering problems involving members under axial load, torsion of circular rods and tubes, bending and shear stress in beams ,combine stresses , deflection of beams, buckling of columns.		
Strength of Materials Lab.	20204122	1 (0-3)
Applying theory gained within the strength of materials theoretical through practical experimentation.		
Methods of Measurements	20203121	2 (2-0)
Measurements and measurement systems, units and standards. Signal conditioning, measurement of linear and angular displacement, strain, force, torque, shaft power, motion, vibration, flow, temperature, and pressure and level measurement. Representation of control components: mechanical, electrical, thermal, hydraulic and pneumatic. Representation of control systems. Steady state operation, transient state-space methods.		
Methods of Measurements Lab.	20203122	1 (0-3)
Measuring instruments calibration, Sensors and transducers output characteristics, measurements of electrical parameters, error estimations. Mechanical parameters measurements, temperature measurement.		
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		

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Mechanical Drawing	20204211	2 (0-6)
The course is designed to develop the technical sense for the student and enable him to create and analyze the different mechanical parts, pipes and ducts, mechanical and HVAC symbols . Assembly and detailed drawings for technical arrangements. Applications for CAD and Solid Works modeling.		
Manufacturing Processes 1	20202111	2 (2-0)
Hot and Cold working of metal,(Plastic Deformation, Rolling, Forging, Extrusion, Drawing, pipe and tube manufacturing,) and foundry processes		
Manufacturing Processes 1 Workshops	20202112	1 (0-3)
Application of following processes: forging, Drawing, extrusion, Rolling. Sand Casting and Molding Procedures.		
Manufacturing Processes 2	20202211	2 (2-0)
Metal Cutting methods, Turning, Drilling, Milling, Sawing, Planning. Machining Cutters operations.		
Manufacturing Processes 2 Workshops	20202212	1 (0-3)
Applications of different kinds of metal cutting. Safety measures .using measuring devices.		
Welding Technology 1	20203111	2 (2-0)
Types of welding, types of welded joints, welding position, weld ability, Electrical Arc welding, Gas welding, Arc cutting of metal, Oxygen Cutting of metal.		
Welding Technology 1 Workshops	20203112	1 (0-3)
Application of Oxy-Acetylene welding and cutting techniques, practicing of electrical Arc welding.		
Welding Technology 2	20203213	3 (3-0)
Electrical Resistance Welding, Fraction welding, Thermal, welding, Submerged Arc welding, Gas shielded- Arc welding, Ultrasonic welding, Explosive welding, Electron beam welding, Laser welding. Weldebility, Welding of various metals, testing welds, welding quality and safety.		
Welding Technology 2 Workshops	20203214	1 (0-3)
Application of different kinds of resistance welding, and TIG, MIG, MAG welding, Practicing methods for testing welds.		

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Reclamation by Welding	20203215	2 (2-0)
Mechanical and chemical corrosion, factors affecting reclamation method, Types and method of reclamation welding, metal spraying. Plasma spraying and chemical methods reclamation of engine, hand forming technology, panting technology.		
Reclamation by welding Workshops	20203216	1 (0-3)
Application of different kinds of Reclamation by welding, and hand forming of metal sheets, panting technology.		
Metallurgical Heat Treatment	20201271	2 (2-0)
Property change due to heat treatment. Iron-carbon system. Surface hardening. Powder metallurgy, metal surface treatment. Composite materials. Electro plating. Chemical and mechanical treatment of ferrous materials and alloys. Destructive and non-destructive evaluation.		
Metallurgical Heat Treatment Lab.	20201272	1 (0-3)
Preparation of specimen: Microscopic inspection, Cooling curves and phase diagrams, Corrosion rate measurement. Materials structure analysis. Surface-hardening. Electro plating processes. Iron-carbon system. Heat treatment and tests. Preparation and using of powders and composites.		
Training	20203291	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	20203292	3
An integrated assembly/design practical work related to the major fields of study.		

