



Curriculum for Associate Degree Program in Advanced Welding Technology Specialization

The curriculum of associate degree in “Advanced 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



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

**The curriculum of associate degree
in
Advanced 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	21302111*
21702111	Communication Skills and Technical Writing	3	2	2	22002101
20201121	Engineering Materials	2	2	-	-
Total		17	10	18	

* 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	
20301111	Electricity and Electronics	2	2	0	21302111*
20301112	Electricity and electronics Laboratory	1	0	3	20301113*
20214111	Welding Drafting	2	0	6	
20212121	Mechanical Measurements	2	2	0	
20212122	Mechanical Measurements Lab.	1	0	3	
20214221	Metals Machining	2	2	0	
20214222	Metals Machining Workshop	2	0	6	
20212231	Manufacturing Processes	2	2	0	
20212232	Manufacturing Processes Workshop	1	0	3	
20214131	Conventional Welding Technology	3	3	0	
20214132	Welding Workshop 1	2	0	6	
202141333	Advanced Welding Technology	3	3	0	
20214134	Welding Workshop 2	2	0	6	
20214231	Advanced Welding Applications	2	0	6	
20214241	Quantity Surveying/ Welding	2	2	0	
20214251	Materials and Welding Testing	2	2	0	
20214252	Materials and Welding Testing Lab.	1	0	3	
20409111	Industrial Supervision	2	2	0	20506111
20203215	Reclamation by welding	2	2	0	
20203216	Reclamation by Welding Workshops	1	0	3	20203215*
20214291	Training**	3	0	-	-
20214292	Project	3	0	-	-
Total		43	22	45	

*-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
21702101	Computer Skills	3	20301111	Electricity and Electronics	2
20214131	Conventional Welding Technology	3	20301112	Electricity and Electronics Lab.	1
20201111	Engineering Workshops	1	20506111	Occupational Safety	2
20214132	Welding Workshop 1	2	20214133	Advanced Welding Technology	3
20212121	Mechanical Measurements	2	20214134	Welding Workshop 2	2
20212122	Mechanical Measurements Lab.	1	21301111	General Mathematics	3
20204111	AutoCAD	2	20214111	Welding Drafting	2
21302111	General Physics	3	22002101	English Language	3
21302112	General Physics Lab.	1			
Total		18	Total		18

Second Year					
Third Semester			Fourth Semester		
Course ID	Course Name	Credit Hours	Course ID	Course Name	Credit Hours
22001101	Arabic Language	3	20214252	Materials and Welding Testing Lab.	1
20214231	Advanced Welding Applications	2	21901100	Islamic Culture	3
20203215	Reclamation by Welding	2	20212231	Manufacturing Processes	2
20203216	Reclamation by welding Workshop	1	20212232	Manufacturing Processes Workshop	1
20201121	Engineering Materials	2	21702111	Communication Skills and Technical Writing	3
20214221	Metals Machining	2	20409111	Industrial Supervision	2
20214222	Metals Machining Workshop	2	20214291	Training	3
20214241	Quantity Surveying/ Welding	2	20214292	Project	3
20214251	Materials and Welding Testing	2			
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 وتذوقها وتحليلها تحليلاً أدبياً؛ تنمية الذوق الجمالي لدى الطلاب الدارسين.</p>		
English Language	22002101	3 (3-0)
<p>English 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 .		

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General Physics lab**21302112****1 (0-3)**

In this course, the student performs thirteen experiments in mechanics and in electricity.

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.

Welding Drafting**20214111****2 (0-6)**

Graphic language and software packages for welding, drafting standards, projections, drafting instruments and tools, geometric constructions, tolerance, intersections and developments, representation of basic types of welded joints, welding symbols, supplementary symbols, dimensioning welding joints.

Mechanical Measurements**20212121****2 (2-0)**

Principles of linear measurements, linear measurements, standards for measurements (metric and inch), tools of measurements, verniers and micrometer angle measurement, combination set, gauge blocks, inspection tools and gauges, dial indicating gauge, surface finish measurements. Mechanical Measurements Laboratory

Mechanical Measurements Lab.**20212122****1 (0-3)**

Measuring lengths with tape, metal rulers, calipers and micrometers, measuring angles with protectors combination sets, use of gauges blocks, comparing dimensions and flatness with dial-indicating gauge.

Metals Machining**20214221****2 (2-0)**

Introduction to metal removal processes, basic machining calculations, cutting and machining, holding devices, lubricants and cutting fluids, sawing operation and power sawing (hacksaws, band saws), drilling machines, drills and drilling operations, shaping, manual grinding, disk cutting, chamfering machines.

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Metals Machining Workshop	20214222	2 (0-6)
This course is designed for entry-level in metal works, based on developing technical senses of students by metal cutting in welding workshops, sawing by band and hack saws, cutting different profiles by disk cutting machines, drilling by stand and manual drilling machines, chamfering joints by shaping and chamfering machines, manual grinding, disk cutting.		
Manufacturing Processes	20212231	2 (2-0)
Hot and cold working of metals, elastic deformation, rolling, forging, extrusion, drawing, pipe and tube manufacturing, casting, molding, and foundry processes. Metal cutting methods, turning, drilling, milling, sawing, planning. Machining cutters and machining operations.		
Manufacturing Processes Workshop	20212232	1 (0-3)
Practical applications of the following processes: forging, drawing, extrusion, rolling. Sand casting and molding processes. Applications of different kinds of metal cutting. Safety measures. Using measuring devices and tools.		
Conventional Welding Technology	20214131	3 (3-0)
Welding theory, welding processes, Oxyacetylene welding equipment, flame, welding positions, visual inspecting welding, cutting with oxyacetylene; arc welding, electric current for arc welding, types of arc welding machines, electrodes, types, specification, numbering system.		
Welding Workshop 1	20214132	2 (0-6)
Setup and operating oxyacetylene welding equipment. Oxyacetylene welding in flat, horizontal, vertical, and overhead positions. Setup and operating arc welding machine. Welding 10mm thick metal sheets in all welding positions.		
Advanced Welding Technology	20214133	3 (3-0)
Advanced welding processes: theory, welding processes, GMAW, GTAW, SAW, and welding equipment. Welding arc forming. Electrodes: types, specification, numbering system.		
Advanced Welding Applications	20214231	2 (0-6)
Setup and operating GMAW, SAW and GTAW welding equipment, welding ferrous metals with tungsten arc, welding non-ferrous metals with tungsten arc, welding stainless steel with tungsten arc. Examples.		

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Welding Workshop 2	20214134	2 (0-6)
Welding cast iron with oxyacetylene flame copper wire and without added materials, oxyacetylene cutting, arc welding thick joints, pipe welding.		

Quantity Surveying/ Welding	20214241	2 (2-0)
Definition of quantities, raw material and welding consumable standards, raw materials calculations, consumable calculations, materials evaluation, metal removal rate, cost calculations, machining time calculations, quantities and cost analysis.		

Materials and Welding Testing	20214251	2 (2-0)
Practicing forming processes and analyzing structure and properties of metals and alloys. Cold rolling, pressing bending, shearing processes, dimensions of raw metals. Welded joint faults, excessive heat effects over metal structure. Types of weld testing, visual test, destructive tests: tensile, impact, nondestructive tests: fluorescent, radiographic tests.		

Materials and Welding Testing Lab.	20214252	1 (0-3)
Structural analysis of metals. Photo-electrical and thermo-electrical effects analysis. Chemical, mechanical, and electrical properties of metals. Welded joint faults, excessive heat effects over metal structure. Types of weld testing. Visual test, destructive tests: tensile, impact, nondestructive tests: fluorescent, radiographic. Examples.		

Industrial Supervision	20409111	2 (2-0)
This course focuses on; supervising industrial labour groups, position, duties, training methods, training needs, Knowledge of maintenance administration and organizing. Production lines organization, working permits, production scheduling, and quality control knowledge. Training knowledge introduction, job standards, job analyzing, training needs study, training programs and curriculums, training evaluation, subordinates appraisal.		

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 Workshop	20203216	1 (0-3)
Application of different kinds of Reclamation by welding, and hand forming of metal sheets, panting technology.		
Training	20214291	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	20214292	3
An integrated assembly/ design practical work related to the major fields of study.		

