

## Curriculum for Three-Years Associate Degree Program in Civil Engineering/ Buildings and Constructions Specialization

The curriculum of three-years associate degree in “Civil Engineering/ Buildings and :Constructions” specialization consists of (99 credit hours) as follows

Serial No.	Requirements	Credit Hours
First	University Requirements	12
Second	Engineering Program Requirements	17
Third	Specialization Requirements	70
Total		99

**The curriculum of three-years associate degree  
in  
Civil Engineering/ Buildings and Constructions 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>	

Third: Specialization Requirements (69 credit hours) as follows:

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20104111	Building Materials	3	3	0	
20112111	Buildings Construction 1	3	2	2	20104111
20112211	Buildings Construction 2	2	2	0	20112111
20102111	Surveying 1	3	3	0	
20102112	Surveying 1 Lab	2	0	6	20102111*
20102113	Surveying 2	3	3	0	20102111
20102114	Surveying 2 Lab.	2	0	6	20102113*
20112121	Engineering Mechanics	3	3	0	21302111
20204121	Strength of Materials	2	2	0	20112121
20112122	Materials Lab	1	0	3	20204121*
20104121	Civil Engineering Drawing	2	0	6	21702101*
20112131	Quantity Surveying 1	3	2	3	
20112231	Quantity Surveying 2	3	2	3	20112131
20104231	Structural Analysis	2	2	0	20204121
20104241	Concrete Technology	2	2	0	
20104242	Concrete Technology Lab	1	0	3	20104241*
20104251	Soil Mechanics	2	2	0	
20104252	Soil & Asphalt Lab	1	0	3	20104251*
20112241	Design Fundamentals	2	2	0	
20104261	Highway Engineering	2	2	0	
20104271	Projects Management	2	2	0	
20112351	Rehabilitation of Structures	3	2	2	
20105222	Plumbing and Electrical Drawings	2	1	3	20112231*
20112361	Construction Workshop 1	2	1	3	
20112362	Construction Workshop 2	2	1	3	
20112371	Writing Skills	3	2	2	
22002102	English Language 2	3	2	2	22002101
20112381	Engineering Economy	3	3	0	
20112391	Training**	3	0	-	-
20112392	Project	3	0	-	-
<b>Total</b>		70	46	50	

\*-Co-requisite

\*\* Equivalent to 280 training hours

## Guiding Plan

First Year					
First Semester			Second semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
22002101	English Language	3	21702101	Computer Skills	3
21301111	General Mathematics	3	22001101	Arabic Language	3
21302111	General Physics	3	20102113	Surveying 2	3
21302112	General Physics Lab	1	20102114	Surveying 2 Lab.	2
20102111	Surveying 1	3	20104111	Building Materials	3
20102112	Surveying 1 lab	2	20112121	Engineering Mechanics	3
20201111	Engineering Workshops	1			
<b>Total</b>		<b>16</b>	<b>Total</b>		<b>17</b>
Second Year					
First Semester			Second semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
20204121	Strength of Materials	2	21702111	Communication Skills & Technical Writing	3
20112122	Materials lab	1	20104271	Projects Management	2
20104241	Concrete Technology	2	20104261	Highways Engineering	2
20104242	Concrete Technology lab	1	20112211	Building Construction 2	2
20104251	Soil Mechanics	2	20506111	Occupational Safety	2
20104252	Soil & Asphalt Lab	1	20104121	Civil Engineering Drawing	2
20112111	Building Construction 1	3	20112131	Quantity Surveying 1	3
20201121	Engineering Materials	2	20112241	Design Fundamentals	2
20204111	AutoCAD	2			
<b>Total</b>		<b>16</b>	<b>Total</b>		<b>18</b>



<b>Computer Skills</b>	<b>21702101</b>	<b>3 (1-4)</b>
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.		
<b>Engineering Program requirements</b>		
<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>11202041</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: Rolls 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>
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In this course, the student performs thirteen experiments in mechanics and in electricity.

### *Specialization Requirements*

<b>1 Building Construction</b>	<b>20112111</b>	<b>3 (2-2)</b>
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The Properties of materials specifications and codes . Site investigation; excavation and fills; foundations; construction of walls; beams and slabs; brickwork and masonry; plastering and painting; sound and thermal insulation; steel structures

<b>2 Building Construction</b>	<b>11220112</b>	<b>2 (2-0)</b>
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Finishing, Wood works, Metal works, Pre-fabricated construction, Construction joints, Modern building technology, Insulation against water and thermal insulation.

<b>Surveying 1</b>	<b>20102111</b>	<b>3 (3-0)</b>
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Introduction to Surveying measurements, Types of measurement, Linear measurement, bearings (directions and angles), Leveling, Theodolite and angle (horizontal, vertical) measurements, setting of horizontal angle and alignments Coordinates, Theory of errors.

<b>Surveying 1 Lab</b>	<b>20102112</b>	<b>2 (0-6)</b>
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Exercises and project covering the topics discussed in the Surveying 1 course.

<b>Surveying 2</b>	<b>20102113</b>	<b>3 (3-0)</b>
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Vertical and horizontal angle measurements, theoretical applications, Tachometric surveying, Electronic Theodolite, Modern Instruments, Total Stations, Curves and curve setting.

<b>Surveying 2 Lab.</b>	<b>20102114</b>	<b>2 (0-6)</b>
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Exercises and projects covering the topics discussed in the Surveying 2 course, briefing about Plane Table.

<b>Concrete Technology</b>	<b>20104241</b>	<b>2 (2-0)</b>
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‘ properties of fresh concrete‘ concrete industry‘ admixtures‘ water‘Cements and aggregates mix design.‘ special types of concrete‘properties of hardened concrete

<b>Concrete Technology Lab</b>	<b>20104242</b>	<b>1 (0-3)</b>
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Hardened concrete; nondestructive Experiments of Concrete ‘Cements; aggregates; Fresh concrete; testing of concrete.

<b>Civil Engineering Drawing</b>	<b>20104121</b>	<b>2 (0-6)</b>
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Basic concepts and conventional symbols of building drawing ,topographic maps ,plans, elevations ,vertical sections , detailing of stairs ,foundations ,beams ,columns, slabs ,drawing of sanitary and electrical installations ,manholes ,and inlets ,drawing of multistory building ,using AutoCAD 2005 in building drawing and steel structures drawing ( 3 hours drafting room drawing + 3 hours AutoCAD drawing ).

<b>Quantity Surveying 1</b>	<b>20112131</b>	<b>3 (2-3)</b>
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of areas and Conditions of Contracts, Measurement Rules, and Quantity take off and Calculations volumes, calculation quantities of all civil and architectural works orientation in tables.

<b>Quantity Surveying 2</b>	<b>20112231</b>	<b>3 (2-3)</b>
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Quantities of: brick works, building stones, tiles, painting, electrical works, mechanical works,

sewage systems, Term Projects: quantities and cost estimation of buildings and roads.

<b>Projects Management</b>	<b>20104271</b>	<b>2 (2-0)</b>
Introduction to Project Management, Scheduling Methods, Arrow Networks, Critical path Method (CPM), Bar Chart, Cost-time Trade –off, Analysis of Resources, Computer- Aided Project Management.		
<b>Soil Mechanics</b>	<b>20104251</b>	<b>2 (2-0)</b>
Physical properties of soil, Atterberg limits, soil classification systems, stresses in soil, shear strength of soil, water in soil and theory of permeability and settlements of soil, lateral earth pressure and retaining structure, soil compaction, bearing capacity.		
<b>Asphalt Lab</b>	<b>20104252</b>	<b>1 (0-3)</b>
Experiments of Soil and asphalt pavement.		
<b>Building Materials</b>	<b>20104111</b>	<b>3 (3-0)</b>
Classification of materials used in building construction, their properties and applications.		
<b>Engineering Mechanics</b>	<b>20112121</b>	<b>3 (3-0)</b>
Statics of Particles: Equilibrium of Particles; Rigid bodies; Equivalent System of Forces; Centroids and Centers of Gravity; Analysis of Structures; Frames, Machines; Moments of Inertia, Review of Particle Dynamics, Kinematics and Dynamics of Plane Systems.		
<b>Highways Engineering</b>	<b>20104261</b>	<b>2 (2-0)</b>
Highway types, road users, highway geometric design, horizontal and vertical alignments of roads, cross sections, design of rigid and flexible pavement, drainage and erosion control traffic engineering, road maintenance.		
<b>Plumbing and Electrical drawings</b>	<b>20105222</b>	<b>2 (1-3)</b>
Practicing on electrical and mechanical drawings and symbols, with basic theoretical knowledge.		
<b>Structural Analysis</b>	<b>20104231</b>	<b>2 (2-0)</b>
Basic statics, determinacy and stability of structures, structural analysis of plane trusses, analysis of indeterminate beams using moment distribution method.		
<b>Strength of Materials</b>	<b>20204121</b>	<b>2 (2-0)</b>
Principles of statics including equilibrium and static equivalence. Determination of moment and force resultants in slender members. Introduction to mechanics of deformable bodies; concepts 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 in beams, buckling of columns.		
<b>Materials Lab</b>	<b>20112122</b>	<b>1 (0-3)</b>
Testing of steel mechanical properties, Tests of brick and tile, Tests of wood, pipe testing.		
<b>Design Fundamentals</b>	<b>20112241</b>	<b>2 (2-0)</b>
Design of concrete elements: Flexural members (singly and doubly reinforced concrete sections, rectangular and nonrectangular sections) Design for shear and torsion, development lengths; Design of steel structures: compression and tension members, beam column elements, Design of steel connections.		
<b>Rehabilitation of Structures</b>	<b>20112351</b>	<b>3 (2-2)</b>
Concepts of rehabilitation, Prevention better than cure, Evaluation of conditions of existing structures, Destructive and non-destructive testing, Mechanisms of deterioration of concrete,		



Corrosion of steel, Repairing materials, Repairing and strengthening techniques, Demolition of structures.

<b>Construction Workshop 1</b>	<b>20112361</b>	<b>2 (1-3)</b>
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Formworks and shuttering of: foundations, columns, beams, slabs; Construction of walls and stairs and Building stones.

<b>Construction Workshop 2</b>	<b>20112362</b>	<b>2 (1-3)</b>
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The course focuses on the construction of the finishing of structures: Brickworks and partitions, plastering, painting, tiles; Mechanical and Electrical systems.

<b>Engineering Economy</b>	<b>20112381</b>	<b>3 (3-0)</b>
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Engineering projects, Feasibility studies and decision making, Money and time value, Profit formulas and applications, Approaches of comparison of engineering alternatives (present value, equivalent and uniform cash flow), Depreciation, Estimation taxes.

<b>Writing Skills</b>	<b>20112371</b>	<b>3 (2-2)</b>
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Documentation, reports in Arabic and English related to civil engineering activities and duties. Preparing and filling specific forms used in civil engineering.

<b>English Language 2</b>	<b>22002102</b>	<b>3 (2-2)</b>
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This integrated course is a continuation of Beginning English 101 to improve English language skills with emphasis on listening, speaking, reading, writing, vocabulary and grammar. Within a formal classroom environment students will be able to actively participate in a wide range of classroom activities at the beginning level in addition to building a foundation of English for use in the tourism and hospitality industries

<b>Training</b>	<b>20112291</b>	<b>3 (280 training hours)</b>
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Equivalent to 280 Hours of field training targeted to emphasize the ability of students to apply the Theories in the real word of the profession.

<b>Project</b>	<b>20112292</b>	<b>3</b>
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An integrated design project to practice the principles of analysis and design acquired throughout the course of the student's study.