

## Curriculum for Associate Degree in

### Geographic Information Systems and Remote Sensing Specialization

The curriculum of associate degree in “Geographic Information Systems and Remote Sensing” 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  
**Geographic Information Systems and Remote Sensing**

**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 follows:

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

**Third:** Specialization Requirements (43 credit hours) as follows:

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20102111	Surveying 1	3	3	0	
20102112	Surveying 1 Laboratory	2	0	6	20102111*
20102113	Surveying 2	3	3	0	20102111
20102114	Surveying 2 Lab.	2	0	6	20102113*
20104261	Highways Engineering	2	2	0	
20106211	Glopal Positioning Systems	2	1	3	
20106121	Geographic Information Systems 1	2	2	0	20102111
20106122	Geographic Information Systems 1 Lab.	1	0	3	20106121
20106221	Geographic Information Systems 2	2	2	0	20106121
20106222	Geographic Information Systems 2 Lab.	2	0	6	20106221*
20106231	Remote Sensing 1	2	2	0	
20106232	Remote Sensing 1 Lab.	1	0	3	20106231*
20106233	Remote Sensing 2	2	2	0	20106231
20106234	Remote Sensing 2 Lab.	2	0	6	20106233*
20106141	Mapping Science	2	1	3	20102111
20102216	Photogrammetry	2	1	3	
20106101	Computer Skills 2	3	2	3	21702101
20106251	Digital Image Processing Lab.	1	0	3	20106231*
20106261	Analytical Photogrammetry Lab.	1	0	3	20102216
20106291	Training*	3	-	-	-
20106292	Project	3	-	-	-
<b>Total</b>		<b>43</b>	<b>21</b>		

\*-Co-requisite

\*\* Equivalent to 280 training hours

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

## Guiding Plan

First Year					
First Semester			Second Semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
21702101	Computer Skills	3	21702111	Communication Skills and Technical Writing	3
21301111	General Mathematics	3	21901100	Islamic Culture	3
21302111	General Physics	3	20102111	Surveying 1	3
21302112	General Physics Lab.	1	20102112	Surveying 1 Lab.	2
20506111	Occupational Safety	2	20106121	Geographic Information systems 1	2
22001101	Arabic Language	3	20106101	Computer Skills 2	3
22002101	English Language	3	20106141	Mapping Science	2
<b>Total</b>		<b>18</b>	<b>Total</b>		<b>18</b>

Second Year					
Third Semester			Fourth Semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
20102216	Photogrammetry	2	20201121	Engineering Materials	2
20106221	Geographic Information Systems 2	2	20106233	Remote Sensing 2	2
20106222	Geographic Information Systems 2 Lab.	2	20106234	Remote Sensing 2 Lab.	2
20106231	Remote Sensing 1	2	20206251	Digital Image Processing Lab.	1
20106232	Remote Sensing 1 Lab.	1	20106261	Analytical Photogrammetry Lab.	1
20201111	Engineering workshops	1	20104261	Highways Engineering	2
20204111	AutoCAD	2	20106211	Global Positioning Systems	2
20102113	Surveying 2	3			
20102114	Surveying 2 Lab.	2	20106291	Training	3
20106122	Geographic Information Systems Lab.	1	20106292	Project	3
<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)
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Arabic Language	22001101	3 (3-0)
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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.

English Language	22002101	3 (3-0)
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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.

Islamic Culture	21901100	3 (3-0)
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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)
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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.

**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.		

### Specialization Requirements

<b>Surveying 1</b>	<b>20102111</b>	<b>3 (3-0)</b>
Introduction to Surveying measurements, types of measurement, linear measurement, Theory of errors, bearings (directions and angles), areas computations, leveling, coordinates.		
<b>Surveying 1 Lab.</b>	<b>20102112</b>	<b>2 (0-6)</b>
Exercises and project covering the topics discussed in the Surveying 1 course.		
<b>Surveying 2</b>	<b>20102113</b>	<b>3 (3-0)</b>
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>
Exercises and projects covering the topics discussed in the Surveying 2 course, briefing about Plane Table.		
<b>Computer Skills 2</b>	<b>20106101</b>	<b>3 (2-3)</b>
Introduction to programming, programming, design, writing, choosing programs using C++		
<b>Digital Image Processing Lab.</b>	<b>20106251</b>	<b>1 (0-3)</b>
Digital image concepts and processing basics.		
<b>Analytical Photogrammetry Lab.</b>	<b>20106261</b>	<b>1 (0-3)</b>
Analytical photogrammetry applications.		
<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>Glopal Positioning Systems</b>	<b>20106211</b>	<b>2 (1-3)</b>
Satellite systems, Receivers, Control segments, Errors of observations, types of observations: Static survey, Rapid Static survey, Stop&Go Survey, Kinematic Survey, Real Time Survey; the use of GNSS in topography surveying. Exercises and skills, project covering the topics discussed in the GPS course.		
<b>Geographic Information Systems 1</b>	<b>20106121</b>	<b>2 (2-0)</b>
Design and operation of Geo-Spatial Information Systems (GIS ), role of GIS in digital mapping, spatial data management characteristics of GIS; spatial data management system geo-referencing, land Information modeling spatial representation geo-processing input/output operation data base management system, GIS computer hardware, GIS software.		

<b>Geographic Information Systems 1 Lab.</b>	<b>20106122</b>	<b>1 (0-3)</b>
Exercises and project covering the topics discussed in the Geographic Information Systems course.		
<b>Geographic Information Systems 2</b>	<b>20106221</b>	<b>2 (2-0)</b>
Database construction, management and analysis; Exercises and skills, project covering the topics discussed in the Geographic Information Systems (2) course.		
<b>Geographic Information Systems 2 Lab.</b>	<b>20106222</b>	<b>2 (0-6)</b>
Practical applications on Database construction, management and analysis; Exercises and skills.		
<b>Remote Sensing 1</b>	<b>20106231</b>	<b>2 (2-0)</b>
Principles of remote sensing, types of images, thermal images, multi spectral images, applications, resolution ,classification , correction , types of bands and sensors, electromagnetic waves.		
<b>Remote Sensing 1 Lab.</b>	<b>20106232</b>	<b>1 (0-3)</b>
Exercises and project covering the topics discussed in remote sensing course.		
<b>Remote Sensing 2</b>	<b>20106233</b>	<b>2 (2-0)</b>
Advanced Remote Sensing aspects, studying materials specifications using electromagnetic waves.		
<b>Remote Sensing 2 Lab.</b>	<b>20106234</b>	<b>2 (0-6)</b>
Exercises, skills and project covering the topics discussed in Remote Sensing (2) course.		
<b>Mapping Science</b>	<b>20106141</b>	<b>2 (1-3)</b>
Map scales, map projection, types of maps, maps symbols, map drawing, coordinates of maps, topographical maps, and interpretation of topographical maps ,maps profile, digital mapping and map completion; Exercises and project covering the topics discussed in the Mapping course.		
<b>Photogrammetry</b>	<b>20102216</b>	<b>2 (1-3)</b>
Basic principles of aerial photographs, aerial mission, overlaps, drawing maps from aerial photographs, exercises and skills, project covering the topics discussed in Photogrammetry course.		
<b>Training</b>	<b>20106291</b>	<b>3</b>
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>20106292</b>	<b>3</b>
An integrated design project to practice the principles of analysis and design acquired throughout the course of the student's study.		