

Curriculum for Associate Degree Program in Power Plants Specialization

The curriculum of associate degree in “Power Plants” 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
Power Plants 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
20209111	Thermal Engineering	3	3	0	21302111*
20209112	Thermal Engineering Laboratory	1	0	3	20209111*
20204211	Mechanical Drawing	2	0	6	20204111
20207111	Fluids and Hydraulic Machines	3	3	0	21302111*
20207112	Fluids and Hydraulic Machines Lab.	1	0	3	20207111*
20207131	Internal Combustion Engines	3	3	0	20209111
20207132	Internal Combustion Engines Lab.	1	0	3	20207131*
20206211	Steam Generation	3	3	0	20209111
20206212	Steam Generation Lab.	1	0	3	20206212*
20206221	Power Plants 1	3	3	0	20206211*
20206222	Power Plants 1 Lab.	1	0	3	20206221*
20206223	Power Plants 2	3	3	0	20206221
20206224	Power Plants 2 Lab.	2	0	6	20206223*
20206231	Auxiliary Systems for Power Plants	3	3	0	20206223*
20206232	Auxiliary Systems for Power Plants Lab.	1	0	3	20206231*
20206291	Training**	3	0	-	-
20206292	Project	3	0	-	-
Total		43	26	33	

*-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	20207111	Fluids and Hydraulic Machines	3
21302111	General Physics	3	20207112	Fluids and Hydraulic Machines 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
			20209111	Thermal engineering	3
21901100	Islamic Culture	3	20201111	Engineering Workshops	1
Total		18	Total		18

Second Year					
Third Semester			Fourth Semester		
Course ID	Course Name	Credit Hours	Course ID	Course Name	Credit Hours
20204211	Mechanical Drawing	2	20206223	Power Plants 2	3
20207131	Internal Combustion Engines	3	20206224	Power Plants 2 Lab.	2
20207132	Internal Combustion Engines Lab.	1	20206231	Auxiliary Systems for Power Plants	3
20206211	Steam Generation	3	20206232	Auxiliary Systems for Power Plants Lab.	1
20206212	Steam Generation Lab.	1	20206291	Training	3
20206221	Power Plants 1	3	20206292	Project	3
20209112	Thermal Engineering Lab	1	20301111	Electricity and Electronics	2
21702111	Communication Skills and Technical Writing	3	20301112	Electricity and electronics Lab	1
20206222	Power Plants 1 Lab.	1			
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 المشرفة: 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.		
Fluids and Hydraulic Machines	20207111	3 (3-0)
Fluid properties, fluid static's, fluid motion, continuity equation, momentum principle, energy principle, Fluid flow in pipes, pipe friction, introduction to Pumps, Types, Selection and application of pumps.		
Fluids and Hydraulic Machines Lab.	20207112	1 (0-3)
Measuring of physical properties of fluids, force on immersed plate, Jet force on plate, Bernoullis equation, Reynolds experiments, flow through orifices, and nozzle venture friction factor.		
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		
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.		

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Internal Combustion Engines	20207131	3 (3-0)
Definition and introduction to the (ICE) fundamentals of engine, operation engine types and classification, engine construction, engine measurements and performance, engine system (lubrication, cooling, fuel) Including both carburetor and electronic fuel injection system .		
Internal Combustion Engines Lab.	20207132	1 (0-3)
Performance tests for spark and compression engines, air and fuel consumption, air fuel ratio bake and indicated horse power. Specific fuel consumption, volumetric efficiency energy balance, variable compression ratio rest engine emission, diagnostic, adjustment of engine.		
Steam Generation	20206211	3 (3-0)
Basic understanding of main parts and operation of steam boilers for different applications. Properties of a pure substance. Main components and accessories. Fuels and combustion. Boiler performance. Operation and maintenance.		
Steam Generation Lab.	20206212	1 (0-3)
Experiments on steam generator parts and components, operation, water treatment unit, boiler efficiency.		
Power Plants 1	20206221	3 (3-0)
Classification of power plants, steam power plants, Rankine cycle, reheat and regeneration, condensers, pumps and piping networks, types of steam turbines, water desalination and treatment units, operation and maintenance of steam power plants.		
Power Plants 1 Lab.	20206222	1 (0-3)
Experiments on steam power plant: parts and components, operation, water treatment unit, Rankine cycle efficiency.		
Power Plants 2	20206223	3 (3-0)
Gas turbine power plants, combined cycle, diesel power stations, hydro-electric power stations, operation and maintenance of gas turbine based power plants, environmental impacts of power generation.		
Power Plants 2 Lab.	20206224	2 (0-6)
Experiments on gas turbine and diesel engine power stations: parts, operation and efficiency.		
Auxiliary Systems for Power Plants	20206231	3 (3-0)
Feed water treatment, cooling system, fuel systems, oil and lubrication systems, fans, blowers, pumps, fire fighting systems, chimney and air pollution control equipment.		

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Auxiliary Systems for Power Plants Lab.	20206232	1 (0-3)
Experiments related to Waste water treatment, cooling system, oil and lubrication systems, fans, blowers, pumps, fire fighting systems, chimney and air pollution control equipment.		
Training	20206291	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	20206292	3
An integrated assembly/design practical work related to the major fields of study.		

