
curriculum for Technician Diploma Program

in

Air Conditioning, Refrigeration and Heating Systems Specialization

The curriculum of Technician Diploma in “Air Conditioning, Refrigeration and Heating Systems” consists of (66) credit hours as follows:

No.	Field of Requirements	Credit Hours
1	Generic Skills	6
2	Employability Skills	9
3	Supportive Sciences	9
4	Specialization Skills	42
Total		66

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First: Generic Skills Requirements (6) credit hours as follows:

Course Number	Course Title	C.H.	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
10000111	Positive Citizenship and Life Skills	3	3	0	-
10000112	Skills in English Language	3	3	0	-
Total		6	6	0	

Second: Employability Skills Requirements (9) credit hours as follows:

Course Number	Course Title	C.H.	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
10000121	Communication Skills in English Language	3	3	0	10000112
10000122	Small Productive Enterprises Management	3	3	0	-
10000123	Supervision and Industrial Organization	3	3	0	-
Total		9	9	0	

Third: Supportive Sciences Requirements (9) credit hours as follows:

Course Number	Course Title	C.H.	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
10100111	Applied Mathematics	3	3	0	-
10100121	Applied Physics	3	3	0	-
10100122	Applied Physics Laboratory	1	0	3	10100121*
10100131	AutoCAD	1	0	3	
10100141	Engineering Workshop	1	0	3	
Total		9	6	9	

*Co-requisite

**Curriculum for Technician Diploma Certificate Program
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Fourth: Specialization Skills Requirements (42) credit hours as follows:

Course Number	Course Title	C.H.	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
10200111	Electricity and Electronics	2	2	0	10100121*
10200112	Electricity and Electronics Laboratory	1	0	3	10200111*
10200121	Thermal Engineering	3	3	0	
10200122	Thermal Engineering Laboratory	1	0	3	10200121*
10200131	Fluids and Hydraulic Machines	3	3	0	
10200132	Fluids and Hydraulic Machines Laboratory	1	0	3	10200131*
10209111	HVACR Drawing	2	0	6	10100131
10209221	Heating Systems	3	3	0	
10209222	Heating Systems Workshop	2	0	6	10209221*
10209231	Refrigeration Systems	3	3	0	
10209232	Refrigeration Systems Workshop	2	0	6	10209231*
10209241	Air Conditioning Systems	3	3	0	
10209242	Air Conditioning Systems Workshop	2	0	6	10209241*
10209251	HVACR Instrumentation and Control	3	3	0	
10209252	HVACR Instrumentation and Control Laboratory	1	0	3	10209251*
10209261	Sanitary Systems	2	2	0	
10209262	Sanitary Systems Workshop	2	0	6	10209261*
10209243	Air Conditioning and Refrigeration Systems LAB	1	0	3	10209231 + 10209241
10209271	Environmental Impact of Cooling Media	2	2	0	
10209291	Training	3	0		
Total		42	24		

Guiding Plan for Air Conditioning, Refrigeration and Heating Systems Specialization/ Technical Diploma Program

First Semester			Second Semester		
Course No.	Course Title	C.H.	Course No.	Course Title	C.H.
10000111	Positive Citizenship and Life Skills	3	10000121	Communication Skills in English Language	3
10000112	Skills in English Language	3	10200111	Electricity and Electronics	2
10100111	Applied Mathematics	3	10200112	Electricity and Electronics Laboratory	1
10100121	Applied Physics	3	10200121	Thermal Engineering	3
10100122	Applied Physics Laboratory	1	10200122	Thermal Engineering Laboratory	1
10100131	AutoCAD	1	10200131	Fluids and Hydraulic Machines	3
10100141	Engineering Workshop	1	10200132	Fluids and Hydraulic Machines Laboratory	1
			10209111	HVACR Drawing	2
Total		15	Total		16

Third Semester			Fourth Semester		
Course No.	Course Title	C.H.	Course No.	Course Title	C.H.
10000123	Supervision and Industrial Organization	3	10000122	Small Productive Enterprises Management	3
10209221	Heating Systems	3	10209241	Air Conditioning Systems	3
10209222	Heating Systems Workshop	2	10209242	Air Conditioning Systems Workshop	2
10209251	HVACR Instrumentation and Control	3	10209243	Air Conditioning and Refrigeration Systems LAB	1
10209252	HVACR Instrumentation and Control Laboratory	1	10209231	Refrigeration Systems	3
10209261	Sanitary Systems	2	10209232	Refrigeration Systems Workshop	2
10209262	Sanitary Systems Workshop	2	10209291	Training	3
10209271	Environmental Impact of Cooling Media	2			
Total		18	Total		17

Brief Course Description for Air Conditioning, Refrigeration and Heating Systems Specialization

First: Generic Skills

المواطنة الإيجابية ومهارات الحياة 10000111 (3:0-3):

يوضح المساق مفهوم المواطنة ومهارات الحياة وأهميتهما في اكتساب مهارات قيمة، والعمل على استخدام هذه المهارات في سعيهم للحصول على تعليم أفضل ونتائج ايجابية في العمل، حيث ان المساق يراعي بناء المعرفة في الموضوعات التي يتضمنها البرنامج كما ويبني المهارة عند الشباب لاستخدامها في تطبيق المعرفة كما ويبني الثقة في قدرات الشباب على استخدام هذه المعرفة والمهارة بالاضافة الى توفير الدعم الشخصي والبيئي لتغيير السلوك من خلال تعزيز قيم المواطنة الايجابية والثقافة المجتمعية البناء والعمل المجتمعي التطوعي.

Skills in English Language 10000112 (3:3-0)

This is a General English Language course which aims at developing the four English Language receptive and productive Skills; Listening, Reading, Writing and Speaking, as well as providing practice for the basics of grammar and vocabulary for effective and meaningful communication inside and outside the classroom.

Second: Employability Skills

Communication Skills in English Language 10000121 (3:3-0)

This is a communication skills course which aims at improving learners' oral and written communication skills by providing learners with the language needed to naturally and confidently communicate in an English speaking workplace environment and real life situations.

إدارة المنشآت الإنتاجية الصغيرة 10000122 (0-3:3)

يوضح المساق مفهوم المنشآت الإنتاجية الصغيرة وأهميتها في الإقتصاد الوطني والقضاء على البطالة، وكيفية إدارتها و مواجهة التحديات التي تعترضها، وتقييم فرص نجاحها من خلال دراسة الجدوى، وآلية إدارة المشتريات والمخزون، وكيفية تمويلها وإدارة شؤونها المالية، وتقديم خدمة العملاء وكذلك الالتزام بأخلاقيات العمل، وكيفية عمل تسويق لها، والطبيعة القانونية لها وخطة العمل اللازمة للبدء بها مع التركيز على التجربة الأردنية في هذا المجال.

الإشراف والتنظيم الصناعي 10000123 (0-3:3)

المنشآت الصناعية انواعها ومواصفاتها واشكالها ، اشكال التنظيم الاداري وميزاتها، دور الفني في تطوير الصناعة ودوره في التسلسل الهرمي في المؤسسة الصناعية و ادارة ظروف العمل في المنشآت الصناعية . التعرف على المخاطر وطرق السيطرة عليها . التعرف على أجهزة ومعدات الحماية حسب المواصفات المعتمدة، اصناف الحريق معدات مكافحة، الكهرباء مخاطرها تأثيراتها على الانسان الحماية من الكهرباء والمعالجة من الصدمة الكهربائية، التعامل مع المواد الكيماوية

آثارها مخاطرها وشروط التخزين، القوانين المحلية والضمان الاجتماعي.

Third: Supportive Sciences

Applied Mathematics 10100111 (3: 3-0)

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)

Applied Physics 10100121 (3: 3-0)

Applied Physics course designed to explain the basic concepts of physics in two fields:
1- Concepts and applications of mechanical physics including: Vectors, motion in one dimension, Laws of Motion (Newton's laws), work and energy and the linear momentum.
2- Concepts of electricity including: electrical force, electrical field, electrical potential difference, capacitance, current and resistance.

Applied Physics Laboratory 10100122 (1:0-3)

Applied Physics Lab course is to accompany the General Physics course. Laboratory experiments will be in Mechanics and Electricity to reinforce the theoretical portion in the General Physics course.

AutoCAD 10100131 (1:0-3)

Introduction to AutoCAD, application of AutoCAD, commands, geometric entities. geometric construction. dimensioning, free-hand sketching, object representation, orthographic drawing and projections

Engineering Workshop 10100141 (1:0-3)

Apply basic manual skills in engineering workshops: mechanical, electrical and carpentry.

Fourth: Specialization Skills

Electricity and Electronics 10200111 (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 Laboratory 10200112 (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.

Thermal Engineering 10200121 (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 Laboratory 10200122 (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
Fluids and Hydraulic Machines 10200131 (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 Laboratory 10200132 (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.
HVACR Drawing 10209111 (2:0-6) Projects include isometric, elevation, plan and detail drawing of piping systems. Duct layout and views. A computer aided drafting (CAD) and a project is included.
Heating Systems 10209221 (3:3-0) Introduction, Insulation, Heating Load Calculations, Fuel used for Heating Systems, Components Of Hot Water System, Hot Water Heating System, Under-floor System, Vapor Heating System, Hot Air Heating System.
Heating Systems Workshop 10209222 (2:0-6) Safety rules, Tools, machinery associated with Heating Systems. Troubleshooting& repair, services, visits and reports.
Refrigeration Systems 10209231 (3:3-0) Introduction and Concepts, Simple Vapor Compression Cycle, Refrigerants, Cooling Load Estimation, Absorption Refrigeration System, Condensers, Evaporators, compressors, expansion Valves, Application of Refrigeration.
Refrigeration Systems Workshop 10209232 (2: 0-6) Safety rules, Tools, machinery associated with refrigeration, Troubleshooting& repair, services, visits and reports.
Air Conditioning Systems 10209241 (3: 3-0) Introduction, Air Conditioning Processes, Air Conditioning Load Calculations, Central Air Conditioning Methods, Air Ducts and Fans, Filtration, Air Cooler Coils, Air Conditioning Equipments.
Air Conditioning Systems Workshop 10209242 (2: 0-6) Safety rules, Tools, machinery associated with A/C systems. Troubleshooting& repair, services, visits and reports.
HVACR Instrumentation and Control 10209251 (3: 3-0)

Measurement and Pneumatics control, Temperature measurement and control devices, electrical control devices, Domestic Air conditioner control circuit, Air conditioning and heating control system, Temperature control system, Heating system control system.

HVACR Instrumentation and Control Laboratory 10209252 (1: 0-3)

Measuring and control elements, Temperature, pressure, flow rate and humidity measurement and control, Control system of cooling, heating and A/C processes, Adjustment. Monitoring & troubleshooting

Sanitary Systems 10209261 (2: 2-0)

Water sources, water supply of buildings , water storage systems, water heaters , water drainage systems, Sanitary ,accessories, pipes and fittings, hot and cold water diagrams, connecting with the sewerage network.

Sanitary Systems Workshop 10209262 (2: 0-6)

Safety rules, Tools, machinery associated with Sanitary Systems. Troubleshooting& repair, services, visits and reports.

Air Conditioning and Refrigeration Systems LAB 10209243 (1: 0-3)

Liquid Receiver, Section Accumulator, Oil Separator, Operation of the Compressor, aerostatic Expansion Device, Automatic Expansion Device , Capillary Tube Performance, Sub Cooling and Super Heating, Evaporation in Parallel, Solenoid Valve Control, Wet Bulb and Dry Bulb Temperature Measurement, Air Condition Processes, Heating, Cooling Humidification

Training 10209291 (3)

Equivalent to (140 hours) of field training targeted to emphasize the ability of students to apply the theories in the real world of the profession.