

curriculum for Technician Diploma Program

In

Building Services & Maintenance

صيانة وخدمات المباني

(خطة دراسية معتمدة بموجب قرار مجلس عمداء جامعة البلقاء التطبيقية رقم 2017/2016/1360
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The curriculum of Technician Diploma in “Building Services and Maintenance” 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

مخرجات البرنامج: الطالب الخريج من هذا التخصص يصبح مؤهلاً لصيانة وخدمات المباني السكنية والمنشآت الصغيرة، والقيام بأعمال الصيانة الروتينية ومعالجة الاعطال الممكن حصولها في هذه المباني. والتي تشمل:

- 1- صيانة أنظمة التدفئة المركزية والتمديدات الصحية.
- 2- صيانة أنظمة التكييف والتبريد.
- 3- صيانة التمديدات الكهربائية
- 4- صيانة أنظمة المراقبة والاستلايت والانتركم.
- 5- التشطيبات الداخلية للمباني (اعمال الديكور، الدهان، القسارة، ...)
- 6- الصيانة الدورية للمساعد

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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, C.H.		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, C.H.		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, C.H.		9	6	3	

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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	
10316110	Introduction to building services	2	2	0	-
10316130	Mechanical and electrical Measurements Devices	2	2	0	-
10316131	Mechanical and electrical Measurements Devices lab	1	0	3	10316130*
10316220	Electrical protection and control devices in buildings	2	2	0	-
10316221	Electrical protection and control devices in buildings Lab	1	0	3	10316220*
10316222	Security and alarm systems	2	2	0	10316120
10316223	Security and alarm systems workshop	1	0	3	10316222*
10316224	lifting system in buildings	2	2	0	10316120
10316225	lifting system in buildings workshop	1	0	3	10316224*
10316120	Building electrical wiring	2	2	0	10316130
10316121	Building electrical wiring workshop	2	0	6	10316120*
10316240	Plumbing sanitary engineering	2	2	0	-
10316230	Sanitary workshop	2	0	6	10316240*
10316231	Heating and air conditioning systems	2	2	0	10316130
10316233	Air conditioning system workshop	2	0	6	10316231*
10316232	Heating system maintenance workshop	1	0	3	10316231*
10316241	Construction material and equipment	2	2	0	-
10316242	Construction material and equipment Workshop	1	0	3	10316241*
10316243	Insulation and mold treatments	2	2	0	10316241
10316244	Insulation and mold treatments Workshop	1	0	3	10316243*
10316245	Construction maintenance Workshop I	2	0	6	10316241*
10316246	Construction maintenance Workshop II	2	0	6	10316241*
10316111	Health and safety in building maintenance	2	2	0	-
10316291	Training	3	0	-	-
Total, C.H.		42	22	20	

*-Co-requisite

**Guiding Plan for Building Services & Maintenance technology
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	10316110	Introduction to building services	2
10100111	Applied Mathematics	3	10316130	Mechanical and electrical Measurements Devices	2
10100121	Applied Physics	3	10316131	Mechanical and electrical Measurements Devices lab	1
10100122	Applied Physics Laboratory	1	10316220	Electrical protection and control devices in building	2
10100131	AutoCAD	1	10316221	Electrical protection & control devices in building lab	1
10100141	Engineering Workshop	1	10316222	Security and alarm systems	2
			10316223	Security and alarm systems workshop	1
			10316224	lifting system in buildings	2
			10316225	lifting system in buildings workshop	1
Total		15	Total		17

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
10316120	Building electrical wiring	2	10316111	Health and safety in building maintenance	2
10316121	Building electrical wiring workshop	2	10316242	Construction material and equipment's workshop	1
10316230	Sanitary workshop	2	10316243	Insulation and mold treatments	2
10316231	Heating and air conditioning systems	2	10316244	Insulation and mold treatments workshop	1
10316233	air conditioning system workshop	2	10316245	Construction maintenance I Workshop	2
10316232	Heating system maintenance workshop	1	10316246	Construction maintenance II Workshop	2
10316240	Plumbing sanitary engineering	2			
10316241	Construction material and equipment's	2	10316291	Training	3
Total		18	Total		16

Brief Course Description for

Building Services & Maintenance Technology

First: Generic Skills

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

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 (3:3-0)

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 (3:3-0)

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 الاجنماعي.

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:
- 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. - 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**Introduction to Building Services 10316110 (2: 2-0)**

Basic services techniques. Preparations of maintenance site, types of labors and materials used. The basic theory's maintenance of carpentry, plumbing, masonry, electrical and ground maintenance and control systems.

Building services engineering, avid V.chadderton,16 nov201

Building electrical wiring 10316120 (2: 2-0)

The theory of domestic wiring systems. The main components (distribution boards, switches, sockets, plugs, junction box). The basics of installation of components, the process, and maintenance of all the components in the low voltage system.

Electric Wiring: Domestic, Tenth Edition, Author : Coker, A. J. Binding 2015

Building electrical wiring Workshop 10316121 (2: 0-6)

The application of electrical installation of all types of components explained in the (Maintenance of Low Voltage electricity System). The testes applied on circuit's to avoid open circuits. The stability of materials and equipment's used to designate places. Basic application of routine maintenance on domestic wiring system to avoid damage or losses.

Electric Wiring: Domestic, Tenth Edition, Author : Coker, A. J. Binding 2015

Mechanical and electrical Measurements Devices 10316130 (2: 2-0)

This course provides an introduction to Measurements science; and you will study: Electrical quantities, classifications of electrical and electronic instruments, electronic and digital measuring instruments, recording instruments, power energy. Ohm meters, thermal measurements, ambient temperatures, direct temperature, airflow, lux meter, current measurement, pressure, and rotation.

Electrical measurements and measuring instruments - Uday A. Bakshi, Ajay V. Bakshi, Kshiteeja A. Bakshi 2007

Mechanical and electrical Measurements Devices lab 10316131 (1: 0-3)

Experiments have to cover: measurements errors, load effects, using electronic and digital instruments, calibration and power measurements.

Mechanical measurements: thermal measurements, ambient temperature direct temperature, airflow, lux meter, pressure.

Electrical measurements and measuring instruments - Uday A. Bakshi, Ajay V. Bakshi, Kshiteeja A. Bakshi 2007

Electrical protection and control devices in buildings 10316220 (2: 2-0)

The target of the course is to give the student the basic information and skills related to the most common control and protection devices ,The student shall gain the experience of selection and wiring and troubleshooting different control and protection devices such as Fuses, circuit breakers, relay, contactors, and switches, photocell.

- Use select & trouble shooting of fuses, relays, C.B.
- Operate and check different types of relays.
- Connect & investigate current.
- Thermal overload

Electrical Protection Systems, Dr. Samer Abdel- Gawad 2014

Electrical protection and control devices in buildings lab 10316221 (1: 0-3)

The course aims at giving the students practical skills in order to select ,wire troubleshoot and maintain the most common control and protection devices like fuses ,circuit breakers , relays, contactors ,timers ,switches .

Electrical Protection Systems, Dr. Samer Abdel- Gawad 2014

Security and alarm systems 10316222 (2: 2-0)

The target of the course is to give the student the basic information and skills related to the maintenance of most common cases for low current:

- Fire alarms in commercial and domestic buildings.
- sound systems;
- access door,
- intercoms;
- satellite;

Security/ Fire and alarm systems, second edition, John E. Traister

Security and alarms systems workshop 10316223 (1: 0-3)

The target of the course is to give the student the basic practical skills related to the maintenance of most common cases for low current:

- Fire alarms in commercial and domestic buildings.
- sound systems;
- access door,
- intercoms;
- satellite system

Security/ Fire and alarm systems, second edition, John E. Traister

Plumbing sanitary engineering 10316240 (2: 2-0)

This subject will cover the theory of installation and maintenance of Plumbing & Sewerage systems, ventilation fans and all what is an existing residential and commercial buildings of the mechanical systems services, this will include:

- Cut, clean, indentation, welding, flection of pipe.
- Installation of pipe.
- Connection of pipe.
- Installation laundry and connect pipe.
- connection all of hand valve
- Pump system
- domestic water network

The complete guide to plumbing, 6TH edition, 2015, publication by Black and Decker.

Sanitary workshop 10316230 (2: 0-6)

Students will practice the installation and maintenance of Plumbing & Sewerage systems, ventilation fans and all what is an existing residential and commercial buildings of the mechanical systems services, this will include:

- Cut, clean, indentation, welding, flection of pipe.
- Installation of pipe.

- Connection of pipe.
- Installation laundry and connect pipe.
- connection all of hand valve
- Pump system
- domestic water network

The complete guide to plumbing, 6TH edition, 2015, publication by Black and Decker.

lifting system in buildings 10316224 (2: 2-0)

The target of the course is to give the student the basic information related to the maintenance of lifting system components (control system, lifting sensors, emergency break system, cables and poles).

Electric lift installations in steel frame buildings, Ogden. R.G. 2005

lifting system in buildings workshop 10316225 (1: 0-3)

The target of the course is to give the student the practical knowledge and skills related to the maintenance of lifting system components (control system, lifting sensors, emergency brake system, cables and poles, and the electrical motor).

Electric lift installations in steel frame buildings, Ogden. R.G. 2005

Heating and air conditioning system 10316231 (2: 2-0)

Introduction, Insulation, Components Of Hot Water System, Hot Water Heating System, central heating system , Vapor Heating System, Hot Air Heating System ; boilers, burners, cylinder, hot water pump, Fuel pump and filters. Fuel used for Heating Systems.

The function of each component in the systems. Basic maintenance of the components. electrical and mechanical circuits in air conditioning systems, Components of air-conditioning system (split unit, fan coil, central air conditioning, ventilation, Air Ducts and Fans, Filtration, Air Cooler Coils).

Home Heating & Air Conditioning Systems, James Kittle,1990.

Heating system maintenance workshop: (1: 0-3)10316232

This course will enable the students to practice the process of insulation in heating systems. The student will install and maintain the Components Of Hot Water System, Hot Water Heating System, central heating system, Vapor Heating System, Hot Air Heating System.

Home Heating & Air Conditioning Systems, James Kittle,1990.

Air conditioning system workshop 10316233 (2: 0-6)

This course will provide the practical skills in regards to the electrical and mechanical circuits in air conditioning systems, Components of air-conditioning system (split unit, fan coil, central air conditioning, ventilation, Air Ducts and Fans, Filtration, Air Cooler Coils), the defect maintenance, and routine maintenance (cleaning of filters, drainage pipes and routine checks on gas pressure, temperature and the mechanical parts).

Home Heating & Air Conditioning Systems, James Kittle,1990.

Construction material and equipment 10316241 (2: 2-0)

Basics of construction material (cement, sand, reinforcement, aggregates, asphalt, soil types, etc..) the mixes, the handling, the tools, and the equipment; spatula, measuring tapes, hammers, saw, pliers, bubble balance, screw driver. The project life cycle and construction scaffolding

system.

Construction databook ,Sidney M.levy,march5,2010

Construction material and equipment workshop 10316242 (1: 0-3)

This workshop provides the practical application the subject (Construction Material and Equipment). And general practice on the construction process ,and Basic Practice in Maintenance of gypsum boards, paint, tiles, Parquet, doors and windows.

Construction databook ,Sidney M.levy,march5,2010

Insulation and mold treatment 10316243 (2: 2-0)

Types of insulating materials, uses, places of use, and equipment's used in the process. Types of mold, places, dangers and effects. Methods applied to treat mold.

Insulation handbook,Ricard T.Bynum.jr,2000

Insulation and mold treatment workshop 10316244 (1: 0-3)

Practical application of maintenance of insulating materials, uses, places of use, and equipment's used in the process.

Types of mold, places, dangers and effects. Methods applied to treat mold.

Insulation handbook,Ricard T.Bynum.jr,2000

Construction maintenance workshop I 10316245 (2: 0-6)

Practical application of maintenance of skeletal structural elements in both reinforced concrete and steel structures. The tools used, the methods applied, and the effects of weather conditions
Mythology of maintenance for the modern buildings ,Prof.hossam Hassan elbromoly,2003 .

Construction maintenance workshop II 10316246 (2: 0-6)

Practical application of maintenance of plastering, painting, tiles, Parquet, doors and windows, Gypsum boards. The tools used, the methods applied, and the effects of weather conditions. This course it pure practice in construction sites and maintenance companies.

Mythology of maintenance for the modern buildings ,Prof.hossam Hassan elbromoly,2003 .

Health and safety of building services 10316111 (2: 2-0)

This subject will intrados the student to the basic areas of med for health and safety in the maintenance in general, and this includes :

- First aid
- electrical safety
- fire
- chemical hazards
- biological hazards
- work at height(full protection)
- Confined spaces
- waste management
- PPE and loto

Health and safety in building services and engineering, level 2, S. Walson, 17 edition.

Training 10316291 (3)

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.

Al-Balqa' Applied University



تأسست عام 1997

جامعة البلقاء التطبيقية