# Curriculum for Associate Degree Program in Medical Equipment Maintenance Specialization

The curriculum of associate degree in **"Medical Equipment Maintenance"** 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** |

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

**The curriculum of associate degree in**
**Medical Equipment Maintenance 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 | 21302111* |
| 21702111 | Communication Skills and Technical Writing | 3 | 2 | 2 | 22002101 |
| 20201121 | Engineering Materials | 2 | 2 | - | - |
| **Total** | | **17** | **10** | **18** | |

* Co-requisite

❖ **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 | |
| 20301113 | Electrical Circuits | 3 | 3 | - | 21302111* |
| 20301114 | Electrical Circuits Lab | 1 | - | 3 | 20301113* |
| 20403111 | Electronics | 3 | 3 | - | 20301113* |
| 20403112 | Electronics Laboratory | 1 | - | 3 | 20403111* |
| 20404121 | Digital Fundamentals | 2 | 2 | - | 20403111 |
| 20404122 | Digital Fundamentals Laboratory | 1 | - | 3 | 20404121* |
| 20409111 | Industrial Supervision | 2 | 2 | - | 20506111* |
| 20409131 | Physiology and Anatomy | 2 | 2 | - | |
| 20409247 | Medical Equipment | 2 | 2 | - | 20308211* |
| 20409248 | Medical Equipment Workshop | 2 | - | 6 | 20409247* |
| 20308211 | Transducers | 3 | 3 | - | 20404121 |
| 20308212 | Transducers Laboratory | 1 | - | 3 | 20308211* |
| 20409221 | Microprocessor Practice | 2 | 1 | 3 | 20404121 |
| 20409241 | Medical Treatment Equipment | 2 | 2 | - | 20308211* |
| 20409242 | Medical Treatment Equipment Workshop | 2 | - | 6 | 20409241* |
| 20409243 | Medical Laboratories Equipment | 2 | 2 | - | 20308211* |
| 20409244 | Medical Laboratories Equipment Workshop | 2 | - | 6 | 20409243* |
| 20409245 | Medical Imaging Equipment | 2 | 2 | - | 20308211* |
| 20409246 | Medical Imaging Equipment Workshop | 2 | - | 6 | 20409245* |
| 20409291 | Training** | 3 | - | - | - |
| 20409292 | Project | 3 | - | - | - |
| **Total** | | **43** | **24** | **39** | - |

* 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 ID** | **Course Name** | **Credit Hours** | **Course ID** | **Course Name** | **Credit Hours** |
| 20301113 | Electrical Circuits | 3 | 20409111 | Industrial Supervision | 2 |
| 20301114 | Electrical Circuits Lab. | 1 | 22002101 | English Language | 3 |
| 21702101 | Computer Skills | 3 | 20403111 | Electronics | 3 |
| 21301111 | General Mathematics | 3 | 20403112 | Electronics Lab. | 1 |
| 21302111 | General Physics | 3 | 20201121 | Engineering Materials | 2 |
| 21302112 | General Physics Lab. | 1 | 22001101 | Arabic Language | 3 |
| 20506111 | Occupational Safety | 2 | 21901100 | Islamic Culture | 3 |
| 20409131 | Physiology and Anatomy | 2 | 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** |
| 21702111 | Communication Skills and Technical writing | 3 | 20204111 | AutoCAD | 2 |
| 20404121 | Digital Fundamentals | 2 | 20409221 | Microprocessor Practice | 2 |
| 20404122 | Digital Fundamentals Lab. | 1 | 20409245 | Medical Imaging Equipment | 2 |
| 20308211 | Transducers | 3 | 20409246 | Medical Imaging Equipment Workshop | 2 |
| 20308212 | Transducers Lab. | 1 | 20409241 | Medical Treatment Equipment | 2 |
| 20409247 | Medical Equipment | 2 | 20409242 | Medical Treatment Equipment Workshop | 2 |
| 20409248 | Medical Equipment Workshop | 2 | 20409291 | Training | 3 |
| 20409243 | Medical Laboratories Equipment | 2 | 20409292 | Project | 3 |
| 20409244 | Medical Laboratories Equipment Workshop | 2 | | | |
| **Total** | | **18** | **Total** | | **18** |

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

## Brief Course Description

| Course Title | Course No | Credit Hours ( Theoretical /Practical) |
|---|---|---|
| **Arabic Language** | **22001101** | **3 (3-0)** |

تتضمن هذه المادة مجموعة من المهارات اللغوية بمستوياتها وأنظمتها المختلفة: الصوتية، والصرفية، والنحوية، والبلاغية، والمعجمية، والتعبيرية، وتشتمل نماذج من النصوص المشرقة: قرآنية ، وشعرية، وقصصية ، من بينها نماذج من الأدب الأردني؛ يتوخى من قراءتها وتذوقها وتحليلها تحليلا أدبيا؛ تنمية الذوق الجمالي لدى الطلاب الدارسين.

| | | |
|---|---|---|
| **English Language** | **22002101** | **3 (3-0)** |

English 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)** |

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)** |

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***

| | | |
|---|---|---|
| **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: Rolls 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)** |

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.

| General Physics lab | 21302112 | 1 (0-3) |
|---|---|---|

In this course, the student performs thirteen experiments in mechanics and in electricity.

***Specialization Requirements***

| Electrical Circuits | 20301113 | 3 (3-0) |
|---|---|---|

Voltage, Current, and Resistance, Ohm's Law, Energy and Power, Series-Parallel Circuits, Introduction to Alternating Current and Voltage, Capacitors, Inductors, RLC Circuits and Resonance. Electrical Measurements.

| Electrical Circuits Lab. | 20301112 | 1 (0-3) |
|---|---|---|

DC and AC circuits. Resonance. Measuring devices.

| Electronics | 20403111 | 3 (3-0) |
|---|---|---|

Semiconductor devices. Diodes: classification, characteristics and applications. Transistors: classification, characteristics and applications. Amplifiers. Oscillators. Logic gates and Integrated circuits: Basic functions, symbols and applications. Introduction to electronic measurements: Oscilloscope applications.

| Electronics Lab. | 20403112 | 1 (0-3) |
|---|---|---|

Use of oscilloscope in measurements. Investigation of characteristics of semiconductor devices. Construction and study of electronic circuits. Experiments in electronics have to cover the main electronic devices (diode, zener diode, diode applications, BJT, FET, op – amp, oscillator, SCR).

| Digital Fundamentals | 20404121 | 2 (2-0) |
|---|---|---|

Study of numerical systems, theory of Boolean algebra and logic circuits, applications to different types of circuits, study of flip-flops, counters, registers and accumulators, digital system memory including ROM, RAM, and EPROM.

| Digital Fundamentals Lab. | 20404122 | 1 (0-3 |
|---|---|---|

Testing and troubleshooting instruments, Logic circuits, adders, comparators, encoders and decoders, flip-flops, counters, registers, memories RAM, ROM, EPROM.

| Microprocessor Practice | 20409221 | 2 (1-3) |
|---|---|---|

Microprocessor architecture, memories ,basic registers, assembly language or C, interrupters, seven segment, liquid crystal display, dot matrix, applications and simulation.

| Physiology and Anatomy | 20409131 | 2 (2-0) |
|---|---|---|

The human Healthy is the main target for the medical process (patient, doctor (User), Medical Equipment). This course describes the human Body Cellular physiology & its types, the tissues & its types, the Organs & its functions, the Human Body Systems, the human body development, the blood.

| Medical Equipment | 20409247 | 2 (2-0) |
|---|---|---|

This course covered the bioelectric amplifiers, electrodes and transducers, Diagnostic equipment, principles, functions, factors, diagrams, and other related: electrocardiography, pressure measurements, cardiac output measurements, cardiac stimulation, and electroencephalography, and other Diagnostic Equipment.

| | | |
|---|---|---|
| **Medical Equipment Workshop** | **20409248** | **2 (0-6)** |

Workshop in support of the **Medical Equipment** course**.** The practical rules needed to save human, devices, and places. Using Catalogue, Operating Manual, and Service Manual. Install and Reinstall medical equipment and solve problems for diagnostic equipment.

| | | |
|---|---|---|
| **Transducers** | **20308211** | **3 (3-0)** |

The course is intended to give the students the theoretical and technological experience related to different types of transducers used for measurement and control. The course classifies transducers and gives the principles of functioning and application of pressure, displacement, strain, flow temperature and level transducers

| | | |
|---|---|---|
| **Transducers Lab.** | **20308212** | **1 (0-3)** |

At conclusion of the laboratory course, the student shall be able to select, wire or tube, calibrate and specify a wide range of different industrial transducers. The student will be able to carry out troubleshooting and elementary modification to that range of transducer

| | | |
|---|---|---|
| **Medical Treatment Equipment** | **20409241** | **2 (2-0)** |

Treatment Equipment, principles, functions, factors, diagrams, and other related: This course discus the medical treatment Equipment: respiratory instruments, therapeutic and prosthetic devices, Physiotherapy Equipment, Laser therapy, Hemodialysis machine, Electrosurgical unit, Defibrillator, anesthesia machine, Automatic Drug Delivery System, and Operating rooms.

| | | |
|---|---|---|
| **Medical Treatment Equipment Workshop** | **20409242** | **2 (0-6)** |

Workshop in support of the Medical Treatment Equipment course. Students must Install Reinstall, and Solve problems for some medical treatment equipment. Using Operating and service manuals. And how to be careful of the infectious.

| | | |
|---|---|---|
| **Medical Laboratories Equipment** | **20409243** | **2 (2-0)** |

Medical laboratories equipment, principles, functions, factors, diagrams, and other related: Hematology, Blood gas analyzer, Spectrophotometer, Autoclave, Analyzers, coagulometer…etc. The importance of computers in medical sectors.

| | | |
|---|---|---|
| **Medical Laboratories Equipment Workshop** | **20409244** | **2 (0-6)** |

The workshop supports the course of medical lab equipment. Students must Install / Reinstall and Solve problems for Laboratory Instruments in medical sector by using catalogue, operating manual, and service manual.

| | | |
|---|---|---|
| **Medical Imaging Equipment** | **20409245** | **2 (2-0)** |

Study X-Ray Equipment, ultrasonic scanning, and MRI: Principles, Functions, factors, diagrams, and Learn more about safety limits.

| | | |
|---|---|---|
| **Medical Imaging Equipment Workshop** | **20409246** | **2 (0-6)** |
| Describe the parts of the equipment has been studied in Imaging Medical Equipment course practically, and doing service for some of them. Show how they work. Learn how to safe human from x-ray waves. | | |
| **Industrial Supervision** | **20409111** | **2 (2-0)** |
| Supervision duties training knowledge job, introduction job standards, job analysis, training needs study, training programs and curriculum, training evaluation, subordinates appraisal, job organization, production order form filling. | | |
| **Training** | **20409291** | **3 (280 training hours)** |
| 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. | | |
| **Project** | **20409292** | **3** |
| An integrated assembly/design practical work related to the major fields of study. | | |