

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

| ساعة معتمدة | المتطلب | الرقم |
|-------------|-------------------|---------|
| 12 | المهارات العامة | 1 |
| 6 | مهارات التشغيل | 2 |
| 9 | العلوم المساندة | 3 |
| 69 | المهارات المتخصصة | 4 |
| 96 | | المجموع |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

First: General Skills (12 Credits Hours) as follows:

| Course No. | Course Title | Credits Hours | Weekly Contact Hours | | Prerequisite |
|--------------|--------------------------------------|---------------|----------------------|-----------|--------------|
| | | | Theoretical | Practical | |
| 020000111 | Positive citizenship and Life skills | 3 | 3 | -- | - |
| 020000121 | Islamic Culture | 3 | 3 | | |
| 020000131 | National Education | 2 | 2 | | - |
| 020000181 | Military Science | 1 | 1 | | |
| 020000121 | English Language Skills | 3 | 3 | | |
| Total | | 12 | 12 | 0 | |

Second: Operation Skills (6 Credits Hours) as follows:

| Course No. | Course Title | Credits Hours | Weekly Contact Hours | | Prerequisite |
|--------------|---|---------------|----------------------|-----------|--------------|
| | | | Theoretical | Practical | |
| 020000122 | Communication skills in English Language | 2 | 2 | | 020000121 |
| 020000231 | Leading businesses | 2 | 2 | | |
| 020000141 | Health, Environment and Occupational Safety | 2 | 2 | | |
| Total | | 6 | 6 | | |

Third: Supporting Skills (9 Credits Hours) as follows:

| Course No. | Course Title | Credits Hours | Weekly Contact Hours | | Prerequisite |
|------------|-----------------------|---------------|----------------------|-----------|--------------|
| | | | Theoretical | Practical | |
| 020000151 | Mathematical Concepts | 3 | 3 | | |
| 020000161 | Physical Concepts | 3 | 3 | | 020000161 |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

| | | | | | |
|--------------|--------------------------------|----------|----------|----------|--|
| 020000162 | Physics Concepts lab. | 1 | 0 | 3 | |
| 020000171 | Engineering Drawing (Auto Cad) | 2 | 0 | 6 | |
| Total | | 9 | 6 | 9 | |

Fourth: Specialization Skills (69 Credits Hours) as follows:

| Course No. | Course Title | Credits Hours | Weekly Contact Hours | | Prerequisite |
|------------|---|---------------|----------------------|-----------|--------------|
| | | | Theoretical | Practical | |
| 021528118 | Engineering Workshop | 1 | 0 | 3 | |
| 021528111 | Mechanics | 3 | 3 | -- | 020000161 |
| 021528121 | Fluid Mechanics and Hydraulic Machines | 3 | 3 | - | 020000161 |
| 021528125 | Fluid Mechanics and Hydraulic Machines Lab. | 1 | - | 3 | 021528121 |
| 021528112 | Thermal Engineering | 2 | 2 | - | 020000161 |
| 021528116 | Thermal Engineering Lab. | 1 | - | 3 | 021528112 |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

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|-----------|---|---|---|---|-----------|
| 021528119 | Mechanical Drawings | 2 | - | 6 | 020000171 |
| 021528224 | Protection and Control Devices | 2 | 2 | - | - |
| 021528228 | Protection and Control Devices Lab. | 1 | - | 3 | 021528224 |
| 021528241 | Control Technology | 2 | 2 | - | |
| 021528244 | Control Technology Lab. | 1 | - | 3 | 021528241 |
| 021528142 | Digital Fundamental | 2 | 2 | - | |
| 021528145 | Digital Fundamental Lab. | 1 | - | 3 | 021528142 |
| 021528213 | Mechanical Measurement and Transducer | 3 | 3 | - | |
| 021528217 | Mechanical Measurement and Transducer Lab. | 1 | - | 3 | 021528213 |
| 021528222 | Pneumatic Logic | 2 | 2 | - | |
| 021528226 | Pneumatic Logic Lab. | 1 | - | 3 | 021528222 |
| 021528223 | Pneumatic and Hydraulics Drives | 2 | 2 | - | |
| 021528227 | Pneumatic and Hydraulics Drives Lab. | 1 | - | 3 | 021528223 |
| 021528131 | Internal Combustions Engines | 3 | 3 | - | |
| 021528136 | Internal Combustions Engines Lab. | 1 | - | 3 | 021528131 |
| 021528223 | Diesel Engines | 3 | 3 | - | |
| 021528237 | Diesel Engines Workshop | 2 | - | 6 | 021528232 |
| 021528233 | Heavy duty Vehicles Transmission and Suspension | 3 | 3 | - | |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

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|--------------|--|-----------|-----------|---|-----------|
| 021528238 | Heavy duty Vehicles Transmission and Suspension Workshop | 2 | - | 6 | 021528233 |
| 021528234 | Vehicles Diagnoses and Maintenance | 3 | 3 | - | |
| 021528239 | Vehicles Diagnoses and Maintenance Lab. | 2 | 0 | 6 | 021528234 |
| 021528135 | Automobile Engineering | 2 | 2 | - | |
| 021528130 | Automobile Engineering Workshop | 1 | 0 | 3 | 021528135 |
| 021528243 | Vehicles Electricity and Electronics | 3 | 3 | 0 | |
| 021528246 | Vehicles Electricity and Electronics Lab | 1 | 0 | 3 | 021528243 |
| 021528351 | *Field Training | 6 | | | |
| 021528352 | **Practical Experience | 6 | 0 | | |
| Total | | 69 | 40 | | |

* Co-requisite

**Equivalent to 280 training hours.

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

| Guiding Plan First Year | | | | | |
|----------------------------|----------------------------------|--------------|-----------------|--|--------------|
| First Semester | | | Second Semester | | |
| Course ID | Course Name | Credit Hours | Course ID | Course Name | Credit Hours |
| 020000111 | English Language Skills | 3 | 021528131 | Internal Combustion Engine | 3 |
| 020000131 | National Education | 2 | 021528136 | Internal Combustion Engine Lab. | 1 |
| 020000181 | Military Science | 1 | 021528142 | Digital Fundamentals | 2 |
| 020000151 | Mathematical Concepts | 3 | 021528145 | Digital Fundamentals Lab. | 1 |
| 020000161 | Physical Concepts | 3 | 021528119 | Mechanical Drawing | 2 |
| 020000162 | Physics Concepts Lab | 1 | 021528111 | Mechanics | 3 |
| 020000171 | Engineering Drawing and Auto Cad | 2 | 021528121 | Fluid Mechanics and Hydraulic Machines | 3 |
| 021528112 | Thermal Engineering | 2 | 021528118 | Engineering Workshop | 1 |
| 021528116 | Thermal Engineering Lab | 1 | 020000231 | Leading businesses | 2 |
| Total | | 18 | | | 18 |

| First Year | | |
|-----------------|---|--------------|
| Summer Semester | | |
| Course ID | Course Name | Credit Hours |
| 020000121 | Islamic Culture | 3 |
| 021528125 | Fluid Mechanics and Hydraulic Machines Lab. | 1 |
| 021528135 | Automobile Engineering | 2 |
| 021528130 | Automobile Engineering Workshop | 1 |
| 020000141 | Health, Environment and Occupational Safety | 2 |
| 021528224 | Protection and Control Devices | 2 |
| 021528228 | Protection and Control Devices Lab. | 1 |
| Total | | 12 |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

| Second Year | | | | | |
|----------------|--|--------------|-----------------|---|--------------|
| Third Semester | | | Fourth Semester | | |
| Course ID | Course Name | Credit Hours | Course ID | Course Name | Credit Hours |
| 021528232 | Diesel Engines | 3 | 020000111 | Positive Citizenship and Life Skills | 3 |
| 021528237 | Diesel Engines Workshop | 1 | 021528222 | Pneumatic Logic | 2 |
| 021528234 | Vehicles Diagnoses and Maintenance | 3 | 021528226 | Pneumatic Logic Lab. | 1 |
| 021528239 | Vehicles Diagnoses and Maintenance Workshop. | 2 | 021528223 | Pneumatic and Hydraulic Drives | 2 |
| 021528241 | Control Technology | 2 | 021528227 | Pneumatic and Hydraulic Drives Lab. | 1 |
| 021528244 | Control Technology Lab. | 1 | 021528233 | Heavy Duty Vehicles Transmission and Suspension Systems | 3 |
| 020000122 | Communication Skills in English language | 2 | 021528238 | Heavy Duty Vehicles Transmission and Suspension Systems Workshop. | 2 |
| 021528243 | Vehicles Electricity and Electronics | 3 | 021528213 | Mechanical Measurement and Transducer | 3 |
| 021528246 | Vehicles Electricity and Electronics Lab. | 1 | 021528217 | Mechanical Measurement and Transducer Lab. | 1 |
| Total | | 18 | Total | | 18 |

| Third Year | | | | | |
|----------------|----------------|--------------|----------------|----------------------|--------------|
| Fifth Semester | | | Sixth Semester | | |
| Course ID | Course Name | Credit Hours | Course ID | Course Name | Credit Hours |
| 021528351 | Field Training | 6 | 021528352 | Practical Experience | 6 |
| Total | | 6 | Total | | 6 |

هندسة الانظمة الهيدروليكية /الاتات الثقيلة / نظام الثلاث سنوات

Courses Descriptions

| | | |
|-----------|---------|--|
| 020000111 | 3(3-0) | المواطنة الايجابية و مهارات الحياة يوضح المساق مفهوم المواطنة و مهارات الحياة و اهميتها في اكتساب مهارات قيمة، و العمل على استخدام هذه المهارات في سعيهم للحصول على تعليم افضل و نتائج ايجابية في العمل، حيث ان المساق يراعي بناء المعرفة في الموضوعات التي يتضمنها البرنامج كما و يبني المهارة عند الشباب لاستخدامها في تطبيق المعرفة ما و يبني الثقة في قدرات الشباب على استخدام هذه المعرفة و المهارة اضافة الى توفير الدعم الشخصي و البيئي لتغيير السلوك من خلال تعزيز المواطنة الايجابية و الثقافة المجتمعية البناءة و العمل المجتمعي التطوعي. |
| 020000121 | 3(3-0) | الثقافة الاسلامية 1- تعريف الثقافة الاسلامية و بيان معانيها و موضوعاتها و النظم المتعلقة بها- وظائفها و اهدافها. 2- مصادر و مقومات المصادر الاسلامية و الاركان و الاسس التي تقوم عليها. 3- خصائص الثقافة الاسلامية. 4- الاسلام و العلم، و العلاقة بين العلم و الايمان. 5- التحديات التي تواجه الثقافة الاسلامية. 6- رد الشبهات التي تثار حول الاسلام. 7- الاخلاق الاسلامية و الاداب الشرعية في اطار الثقافة الاسلامية. 8- النظم الاسلامية. |
| 020000131 | 2(2-0) | التربية الوطنية يعد مساقا للتربية الوطنية من المتطلبات الاجبارية لجميع طلبة كليات المجتمع الاردنية و امتدادا عضوي لفلسفة التربية الوطنية و التعليم اعتبارها بعدا من ابعاد الاستراتيجية الوطنية للتعليم العالي ، و ينطلق مساق التربية الوطنية من مجموعة من الثوابت الاردنية و على راسها العقيدة الاسلامية السمحة، و مبادئ الثورة العربية الكبرى، و الدستور الاردني و التجربة الوطنية. |
| 020000181 | 1(1-0) | العلوم العسكرية المحور الاول: نشأة و تطور القوات المسلحة/ الجيش العربي، اسلحة المناورة، اسلحة الاسناد، اسلحة الخدمات المحور الثاني: الثورة العربية الكبرى، الحروب العربية/ الاسرائيلية(حرب 1948، 1967، معركة الكرامة 1968، حرب تشرين 1973)، دور القوات المسلحة الاردنية- الجيش العربي في التنمية الوطنية الشاملة. المحور الثالث: الامن العام، المخابرات العامة، قوات الدرك و الدفاع المدني. |
| 020000121 | 3 (3-0) | English Language Skills The course consists of 8 units. Each unit has speaking activities that deal with dialogues, introducing oneself, talking about families. Also the units include pronunciation and listening with intonation activates. The reading and writing activities concentrate on question with in biography, E-mail and writing blog post. |
| 020000231 | 2(2-0) | ريادة الاعمال يوضح المساق مفهوم ريادة الاعمال، تأثيرها في الاقتصاد الوطني و دورها في القضاء على البطالة، و كيفية استحداث افكار ريادية و مبتكرة لتلائم احتياجات المجتمع و مواجهة المخاطر و التحديات التي تعترضها، و تقييم فرص نجاحها من خلال دراسة الجدوى، و كيفية حساب كلفتها و تمويلها و ادارة شؤونها المالية، و كيفية عمل تسويق لها، و الطبيعة القانونية لها و خطة العمل اللازمة للبدء بها مع التركيز على التجربة الاردنية في هذا المجال . |
| 020000141 | 2(2-0) | الصحة و السلامة و البيئة المهنية اهداف الصحة و السلامة في بيئة العمل و طرق حماية المتواجدين و المتأثرين. دراسة اهم المخاطر و اكثرها انتشارا في مختلف مجالات العمل، تميز المخاطر الكيميائية و البيولوجية و السقوط من المرتفعات و المخاطر الفيزيائية في بيئة العمل و الحريق و الكهرباء و المخاطر الناتجة الملائمة، تميز مصادر المخاطر و تأثيرها على الصحة و سلامة العمل و طرق ضبط المخاطر لتخفيف احتمالية حدوثها و التخفيف من نتائجها في حال حدوثها. مناقشة التسلسل الهرمي للسيطرة على المخاطر و طرق اختبار معدات الحماية الشخصية و تطبيق الاسعافات الاولية في حالات الاصابة البشرية. التعرف على المتطلبات |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

القانونية الاردنية الرئيسية لحماية العاملين.

| | | |
|-----------|--|---------|
| 020000151 | Mathematical Concepts | 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). | |
| 020000161 | Physical Concepts | 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. | |
| 021528111 | Mechanics | 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. (Prerequisite: 020000161) | |
| 021528121 | Fluids Mechanics and Hydraulic Machines | 3 (3-0) |
| | Fluid properties, fluid statics, fluid motion, continuity equation, momentum principle, energy principle, Fluid flow in pipes, pipe friction, introduction to Pumps, Types, Selection and application of pumps. (Prerequisite: 020000161) | |
| 021528112 | Thermal Engineering | 2(2-0) |
| | 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. (Prerequisite: 020000161) | |
| 021528116 | Thermal Engineering Lab. | 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. (Prerequisite: 021528112) | |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

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| 021528224 | Protection and Control Devices 2(2-0) Basic concepts and definitions. Normal and up-normal operating conditions. Faults and their causes. Protection. Protection devices: classification, applications, basic structure and principle of operation, characteristics. Ratings of protection devices, troubleshooting and calibration. Selection of protection devices. |
| 021528228 | Protection and Control Devices Lab. 1(0-3) The course aims at giving the student the 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 and measuring transformers. (Prerequisite: 021528224) |
| 021528241 | Control Technology 2(2-1) Basic concepts. Open-loop and closed loop control systems. Representation of systems using block diagrams, transfer functions and frequency characteristics. Modes of linear control. Controller tuning. PC-based control systems. |
| 021528244 | Control Technology Lab. 1(0-3) Experimental study and investigation of open-loop and closed loop systems and their elements using mathematical and physical models. Study of first and second order systems performance Protection. (Prerequisite: 021528241) |
| 021528142 | Digital Fundamentals. 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. |
| 021528213 | Mechanical Measurement and Transducers 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. |
| 021528222 | Pneumatic Logic 2(2-0) Introduction to air logic, industrial application and control characteristics. Fundamentals of logic elements. Concepts and components of moving part logic logic (MPL). Signal transmission and communication, symbology, schematics and flow diagrams. Application of pneumatic logic like bottle filling diagrams. Parts sorting system and press control system. |
| 021528226 | Pneumatic Logic Lab. 1(0-3) The course covers the implementation of different air logic functions (AND, OR, EXOR, Bistable elements) in order to drive single acting and double acting cylinder according to the given control algorithm. (Prerequisite: 021528222) |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

| | | |
|-----------|--|---------------|
| 021528227 | Pneumatic and Hydraulic Drives Lab. The course covers the major activities related to industrial pneumatic and hydraulic drives, such as actuator positioning, speed control, event driven controls, and realizing different sequential operations. | 1(0-3) |
| 021528131 | Internal Combustion Engines 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 . | 3(3-0) |
| 021528232 | Diesel Engines Introduction, specifications, components and types of heavy-duty diesel engines, two stroke, four stroke, water cooled, air-cooled, shape in line cylinders, v-shape (6-v, 8-v, 12-v) cylinders, fuel systems air supplies systems, exhaust systems, lubrication systems, tuning and adjusting, applications on armor vehicles engine. | 3(3-1) |
| 021528237 | Diesel Engines Workshops Practicing on armor vehicle engines ,stating on the vehicles and switching it off dismantling the power pack off the vehicle and mounting it back, recognizing the external and internal components disassembling the engines and assembling it, following the systems on the engine, practicing tuning and adjustment practicing, preventive maintenance. (Prerequisite: 021528232) | 1(0-3) |
| 021528233 | Heavy duty Vehicles Transmission and Suspension Systems. Introduction types of gears planetary gear sets and its laws fluid couplings & torque converters clutches for planetary gear sets engagement automatic transmission integrated gear boxes: power transmission steering – braking in on unit hydraulic circuits controlling gear boxes lubrication system troubleshooting. Suspension systems for heavy –duty vehicles: components types of suspension, trouble shooting. | 3(3-0) |
| 021528238 | Heavy duty Vehicles Transmission and Suspension Systems Workshops Practicing on transmission & suspension systems for different types of heavy duty vehicles (tanks): disassembling the transmission units and assembling it back, troubleshooting & repairs, applying preventive maintenance, disassembling the different components of suspension units and assembling it back, charging with Nitrogen and oil troubleshooting & repairs, applying. (Prerequisite: 021528233) | 2(0-6) |
| 021528234 | Vehicles Diagnosis and Maintenance. Introduction to automotive diagnostics, maintenance and repair, theoretical background about automotive diagnostics, maintenance and repair, types of automotive diagnostics, maintenance and repair, types of automotive maintenance Inspection and service of car components: engine, engine system, transmission, broke system, suspension system, steering. | 3(3-1) |

هندسة الانظمة الهيدروليكية / الالات الثقيلة / نظام الثلاث سنوات

| | |
|-----------|---|
| 021528239 | Vehicles Diagnosis and Maintenance Lab. 2(0-6) Equipment and devices for automotive diagnosis, maintenance repair personal skills in performing inspection and service of cars .Components: engine, transmission, brake system, steering system, suspension system, suspension system and electrical equipment. . (Prerequisite: 021528234) |
| 021528135 | Automobile Engineering 2(2-0) Introduction of fundamentals of engine construction and operation, engine systems, automotive transmission (manual and automatic), suspension system, wheel alignment, automotive brake system, steering system, automotive electric and electronic systems. |
| 021528130 | Automobile Engineering Workshops 1(0-3) Personal safety, automotive workshop safety area Universal hand tools and equipment, special tools used in automotive workshop, car's unit's disassembly / assembly and adjustments. (Prerequisite: 021528135) |
| 021528243 | Vehicles Electricity and Electronics 1(0-3) Introduction, battery, starting system, charging system, ignition system, electronic fuel injection system, lights, safety and signaling, driver information and control devises, wiring harnesses, instrument panel, (CANbus) technology for automotive application. Automobile |
| 021528246 | Vehicles Electricity and Electronics Workshops 1(0-3) Battery testing, Starting system, Diagnostics and maintenance, Ignition systems, Diagnostics and maintenance Lights, Safety and Signaling, Automotive, generators automatic control system. (Prerequisite: 021528246) |
| 021528351 | Training 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. |
| 021528352 | Practical Experience 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. |