

يضم قسم الهندسة الميكانيكية عشرة معامل وهي:

التسلسل	رقم المعمل	اسم المعمل بالعربي	اسم المعمل بالإنجليزي
1	E-118	معمل انتقال الحرارة	Heat Transfer Laboratory
2	E-119	معمل التحكم	Control Laboratory
3	E-120	معمل التبريد والتكييف	Refrigeration & Air Conditioning Laboratory
4	E-160	معمل ديناميكا الآلات	Machine Dynamics Laboratory
5	E-104	معمل الميكانيكا الهندسية	Engineering Mechanics Laboratory
6	E-011	معمل أجهزة القياس	Measuring and Instrumentation Laboratory
7	E-022	معمل ميكانيكا الموائع	Fluid Mechanics Laboratory
8	E-049	معمل الآلات الحرارية	Heat Engines Laboratory
9	E-050	معمل التشغيل الآلي	Automation Laboratory
10	E-040	معمل اختبارات المواد	Material Testing Laboratory
جدول (1-1) المعامل والمختبرات بقسم الهندسة الميكانيكية			

. القسم له حالياً عشرة مختبرات مجهزة بأحدث الأجهزة والجدول التالي (1-1) يحتوي مختصر عن أسماء المعامل وأماكن كل منهم.

1- معمل انتقال الحرارة (E-118)

قائمة ببعض التجارب التي يتم اجرائها في معمل انتقال الحرارة

1. To determine thermal conductivity of solids
2. To determine the thermal Conductivity of Building Materials.
3. Calibration of Temperature Indicator and a Thermocouple.
4. To determine heat transfer coefficients of air flowing across the extended surface.
5. To determine overall heat transfer coefficient in film wise and drop wise condensation.
6. To study the safety devise for steam boiler.
7. To determine heat transfer coefficients for a tubular water to water and water to air heat exchanger.
8. Determine heat transfer coefficient in free and force convection in a circular tube.
9. Determine heat transfer coefficient in parallel and counter flow heat exchanger.
10. Determine the fundamental pressure of liquid.
11. Determine heat transfer in fluidized bed.
12. Determine heat transfer in evaporation process.



Safety Device on Steam Boiler



Film wise and drop wise condensation

2- معمل التحكم (E-119)

قائمة ببعض التجارب التي يتم اجرائها في معمل التحكم:

1. To calibrate different kind of instrument on Calibration Station with required accessory for Operation.
2. To study the corrosion of different material on Corrosion Studies Unit.
3. To study the removal of impurities in water on Flocculation Test Unit.
4. Determine the percentage of air dissolve in water on Aeration Unit.
5. To study the control of level, flow, pressure and temperature different training bench.



Calibration Station



Corrosion Studies Unit

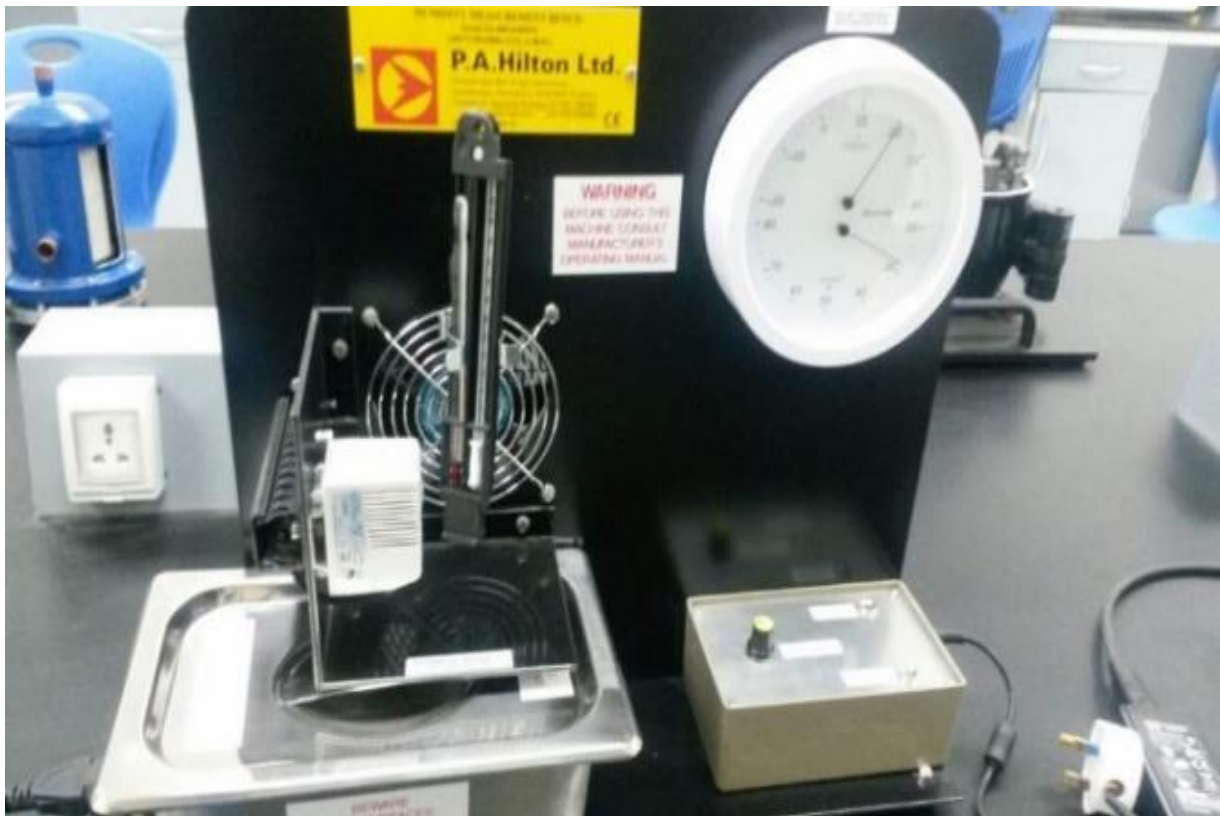
3 - معمل التبريد والتكييف (E-120)

قائمة ببعض التجارب التي يتم اجرائها في معمل التبريد والتكييف

1. Study the basic principles of the vapour compression refrigeration cycle.
2. To demonstrate the fundamental principle of an absorption refrigeration system and its operating behavior under load.
3. Demonstrate the basic operation, servicing and fault-finding procedures on a typical basic vehicle air conditioning system.
4. To study the changes in air properties while cooling and humidification.
5. To give students an appreciation of the construction, design and operational characteristics of a modern evaporative cooling system.
6. To study the changes in air properties while cooling and humidification and learn how determine the specific heat capacity (c_p) of air.
7. To study different type of humidity measurements device.
8. Study the basic training and fault finding on a hermetic refrigeration system using a capillary expansion device.
9. To study theoretical and practical knowledge of the operation of a vapour-compression refrigeration cycle.



Air Conditioning teaching system



Fundamentals of Humidity Measurement

4- معمل ديناميكا الآلات (E-160)

قائمة ببعض التجارب التي يتم اجرائها في معمل ديناميكا الآلات:

1. Study the basics of Cam analysis on Cam Analysis Apparatus.
2. To determine stress and strain on a thin walled film.
3. Demonstration of Euler Buckling.
4. To study the free and force vibration.
5. To study the torsional vibration on circular rod.
6. Demonstration of four bar mechanism.
7. Demonstration of quick return mechanism.
8. Study the deformation of bar under bending.



Torsional Vibration Apparatus



Free and Forced Vibration Apparatus

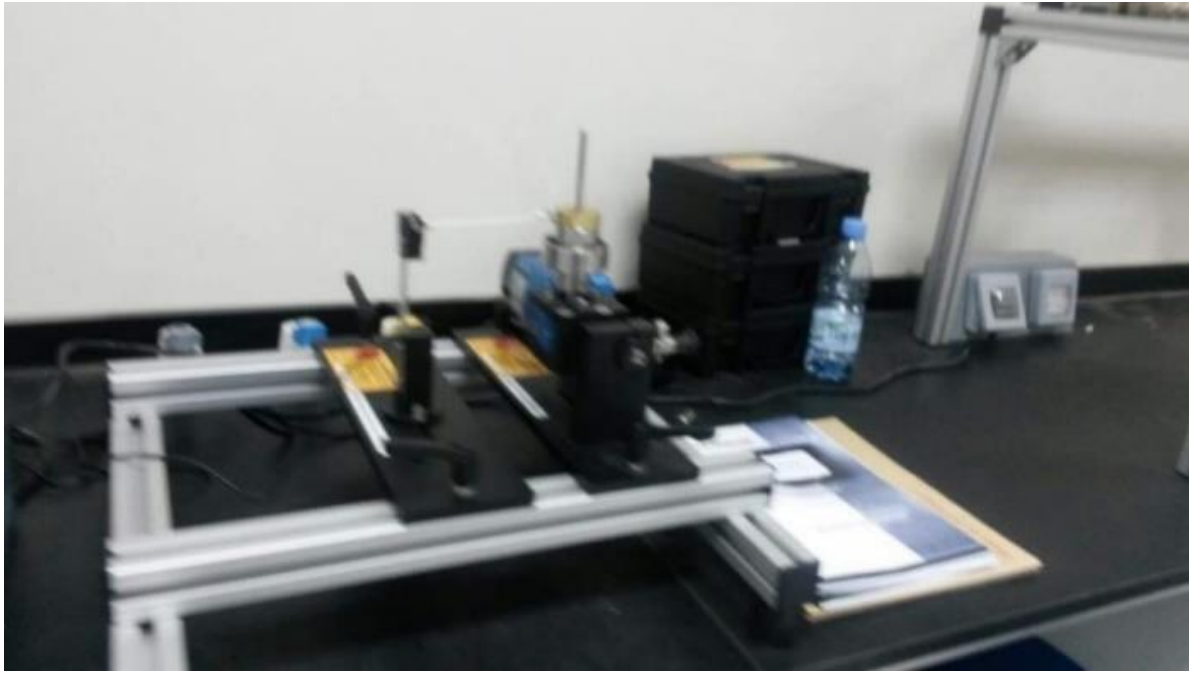
5- معمل الميكانيكا الهندسية (E-104)

قائمة ببعض التجارب التي يتم اجرائها في معمل الميكانيكا الهندسية

1. Study the lifting of gears on Spur Gear Lifting Apparatus.
2. To determine forces in simple Truss.
3. Determine the different forces on reciprocating engines.
4. Determine stress and strain on a membrane.
5. Demonstration of lath gear apparatus.
6. Demonstration of Ackermann Steering apparatus.
7. Demonstration of Crank and Connecting Rod apparatus.
8. Demonstration of Gear Trains Apparatus.



Spur Gear Lifting Apparatus



Tribology Trainer Basic Module

6- معمل أجهزة القياس والآلات (E-011)

قائمة ببعض التجارب التي يتم اجرائها في معمل أجهزة القياس والآلات

1. Study the Photoelastic with overhead projector.
2. To determine Gauge factor of strain gauge.
3. Demonstration of Dimensional metrology training kits.
4. Study the Pneumatics basic and advance level training units.
5. Determine the stress and strain on thick walled cylinder with multi-channel measurement amplifier.
6. Study the Pneumatics for hydraulic basic and advance level training units.



Pneumatics Basic Level

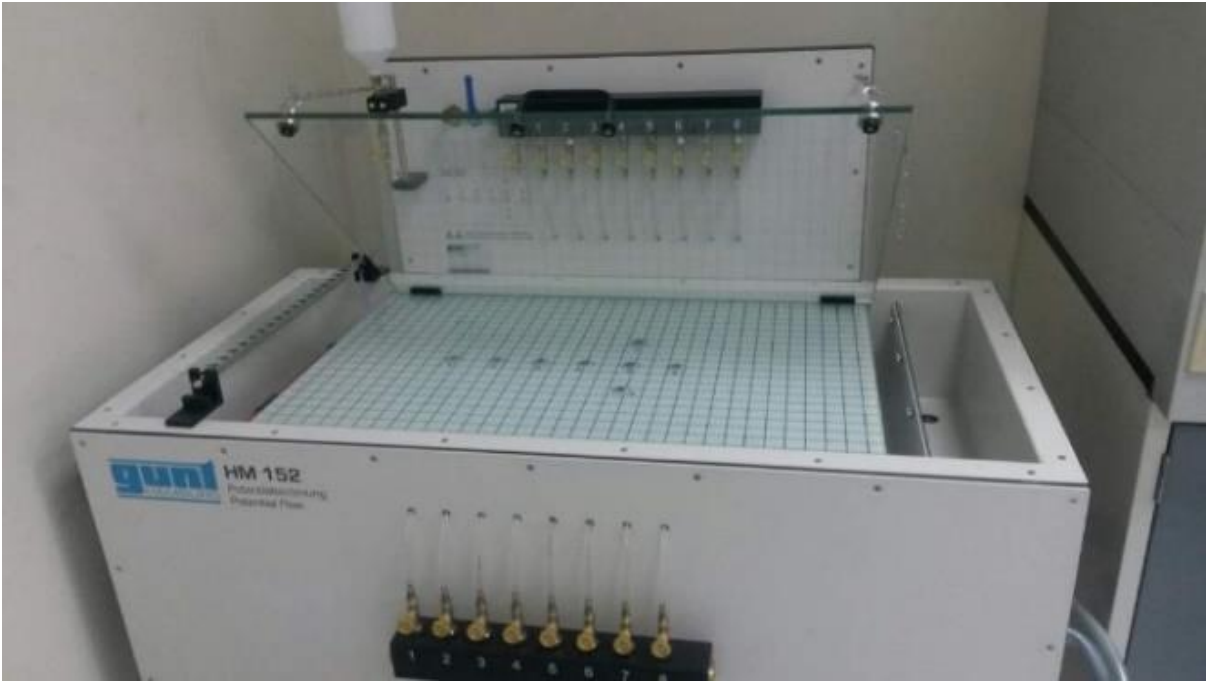


Basic level: Basic training in Hydraulics

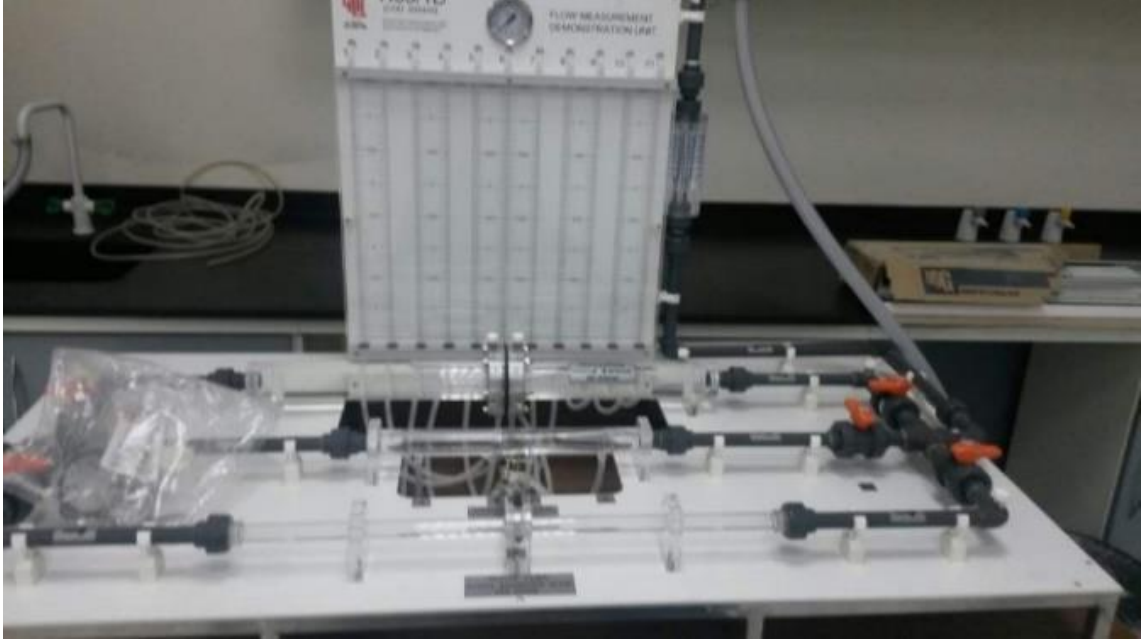
7- معمل ميكانيكا الموائع (E-022)

قائمة ببعض التجارب التي يتم اجرائها في معمل ميكانيكا الموائع

1. Demonstration of centrifugal pump.
2. Demonstration of serial and parallel pumps system.
3. Demonstration of plunger pump.
4. Demonstration of gear pumps system.
5. Demonstration of Flow meter.
6. Determine the particle drag coefficient in different viscous fluid.
7. Demonstration of laminar flow abounds different shapes on Laminar flow table.
8. Study the water hammering process on pipe surge and water hammer apparatus.
9. Study the fluids properties on fluid properties and hydrostatics bench.
10. Demonstration of Reynolds experiments



Laminar Flow Table

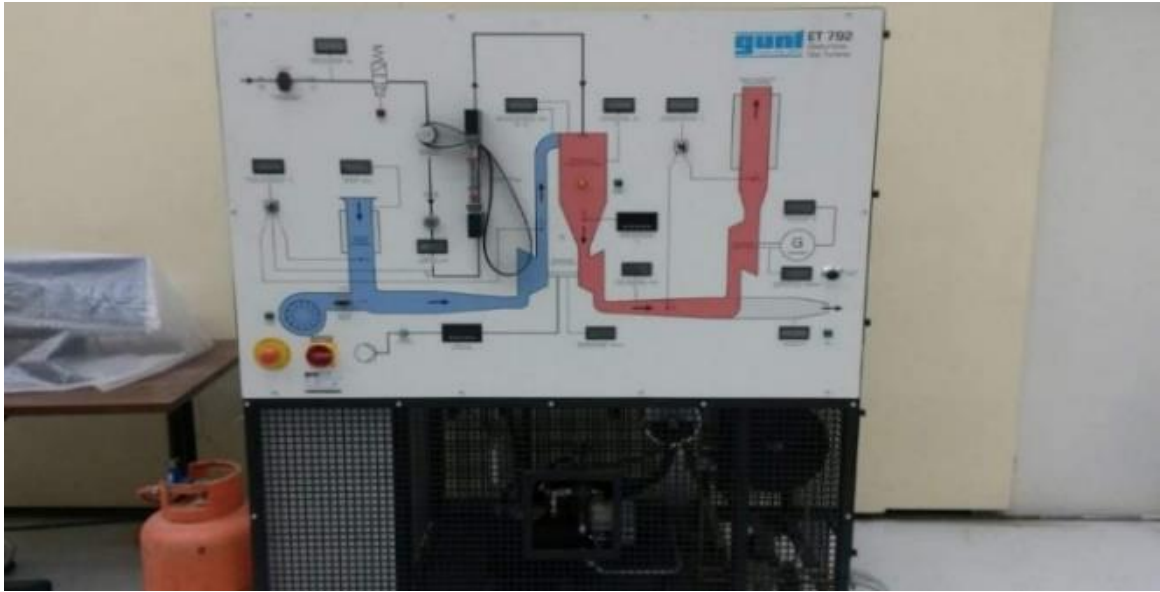


Flow Meter Demonstration Unit

8- معمل الآلات الحرارية (E-049)

قائمة ببعض التجارب التي يتم اجرائها في معمل الآلات الحرارية

1. To study the working of gas turbine Jet engine.
2. To study the working principle of gas turbine unit.
3. To study flow characteristics of nozzle and nozzle pressure distribution.
4. To study the 4-cylinder petrol and diesel engine.
5. To study working principle of steam engine.
6. To study the working principle of steam turbine unit.



Gas Turbine



4-Cylinder Diesel Engine

9- معمل التشغيل الآلي (E-050)

قائمة ببعض التجارب التي يتم اجرائها في معمل التشغيل الآلي

1. To study the working of CNC Lath machine.
2. To study the industrial robot.
3. CNC class room (programming).
4. To study the working principle of robot on Robot station.
5. To study the working of CNC milling machine.



Robot station



Automated pneumatic Robotic interface

-10 معمل اختبارات المواد (E- 040)

قائمة ببعض التجارب التي يتم اجرائها في معمل اختبارات المواد

1. Study the torsion test for rod on Torsion line tl 200.
2. Study the tensile, compressive and tensile test on all round-line materials testing.
3. Study to determine hardness of different materials by Digital shore hardness tester.
4. To study the working principle of Universal Milling and Drilling machine.
5. To study the working of Reciprocating Sawing Machine.
6. To study the impact test on Pendulum impact tester.



All round-line materials testing



Universal Milling and drilling machine