

Computer Laboratory

The Computer Laboratory contains 30 desktop. Engineering software packages are provided and served by Windows. All software packages are provided in every general access computer lab, available software packages are:

- Autocad
- SAP2000
- Premavira
- Ansys
- Matlab



Location :

Main building, First Floor.

Highway Engineering Laboratory

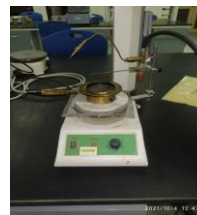
Course Taught:

431 CE-3 Highway Engineering

The highway engineering Laboratory is utilized for:

- Testing and evaluating bitumen, aggregates and asphalt mixes.
- Determining asphalt binder properties like penetration, viscosity, ductility, Flash point and softening point.
- Comprehensive aggregate characterization can be undertaken through tests like, gradation, soundness, specific gravity and CBR.
- Sampling, testing and evaluation of Hot Mix Asphalt.

Equipment like, fully automated Universal Testing Machine to determine stress-strain and strength properties under simulated traffic loading, gyratory compactor with computer control, Marshal Stability and flow testing machine, asphalt extraction apparatus and core drilling of asphalt pavements is held. The laboratory is fully equipped to provide effective support to academic and research related activities in the field of flexible pavement design and analysis for undergraduate Civil Engineering program.



Lab Items	Qty
calibration kit	1
rotational viscometer لزوجة متر التدويره	2
cylinder mould 100mm مم ١٠٠	2
cylinder mould 150mm مم ١٥٠	2
ductility testing apparatus	1
digital asphalt thermometer	1
hubbard-carmick specific gravity bottles	3
travelling beam device	1
compact core drill machine	1
benkelman beam	1
asphalt centrifuge extracto	1
extractor reflux	1
automatic compaction apparatus	1
marshal test 50	1
apparatus vacuum pyknometer	1
heating/thin film oven loss on	1
automatic penetrometer apparatus	1
cleveland flash cup apparatus	1
hot extractor apparatus	1
binder recovery apparatus double sample unit	1
automatic ring and ball apparatus	1
percentage refusal density apparatus	3
bacon sampler	5
superpave gyratory compactor	1
ignition oven	1
rolling thin film oven	1

Location :

Main building, Ground Floor.

Soil Mechanics Laboratory

Course Taught:

221CE -3 Soil Mechanics (1)


322CE -3 Soil Mechanics (2)

Experiment Performed:

The Soil Mechanics Laboratory (Figure 1) is utilized to determine the geotechnical properties of soil (physical, engineering, and mechanical) and geotechnical design parameters. The following tests are conducted in this laboratory:

- Water content test.
- Unit weight test.
- Specific gravity test.
- Sieve analysis test.
- Hydrometer test.
- Liquid limit test.
- Plastic limit test.
- Shrinkage limit test.
- Constant head permeability test.
- Falling head permeability test.
- Standard proctor test.
- Modified proctor test.



<ul style="list-style-type: none"> ○ Degree of compaction test. ○ Dynamic cone penetration test. ○ Pocket penetrometer test. ○ Shear Box test (Direct shear test). ○ Undrained tri-axial test. ○ Consolidation test (Oedometer). ○ California bearing ratio test (CBR). 	 <p>2021/10/5 10:49</p> <p>Facilities:</p> <p>WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.</p>
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lab items	Qty
static cone penetrometer	3
consolidation apparatus	3
direct shear apparatus جهاز القص المباشر	3
casagrande liquid limit device	6
plastic limit set	6
static and dynamic triaxial apparatus	1
sand cone density -6-1/2	5
sand cone density -	5
balloon density apparatus	5
set of sieves	2
rapid moisture meter	2

pycnometer	2
sand puring cylinder	2
standard proctor test)	3
modified proctor test	3
hydrometer test apparatus ٢	3
grain size distribution	3
bench-mounting mixer 5 liters nominal capacity	2
Constant level tank.	2
vacuum pump	2
falling head permeability cell	2
standpipe panel	2
soaking tank	2
aluminum scoop, small	4
timer clock	3
semi-automatic cone penetrometer apparatus	5
penetration test cone	5
penetration test cup	5
glass plate	5
wash bottle polythene	5
volumetric shrinkage set	3
vernier calipers	4

Location:

Main Building, Ground Floor.

Structural and concrete laboratory:

Structural and concrete laboratories play an important role in serving academic and research programs for students and faculty members of the Civil Engineering Department. These laboratories conduct research and laboratory tests for several public and private sectors.

The structural and concrete laboratories are equipped with latest technology and equipment for testing according to international standards. In addition to the academic role of these laboratories, many tests are carried out for the public and private sectors, either within the programs of maintaining quality, or in the technical research supported by different sectors, or on the new materials sought by some companies to enter into the local markets, or To understand the behavior of structural elements in order to develop building codes, or sometimes to conduct conflicts between different parties.

These tests are carried out on the structural materials of different types in order to find their properties and their suitability for the installations. These tests are also carried out on traditional and non-conventional concrete repair materials in order to determine their effectiveness in the repair of the concrete, in addition to durability tests, corrosion resistance, Long-term environmental conditions. In addition, modern techniques are chosen to increase the efficiency of various structural elements such as beams, columns, slabs, walls and concrete joints to resist the loads caused by earthquakes and explosions.

المعمل البحثي	الجهاز	مجال التخصص
معمل هندسة المواد والإنشاءات	Ultra sound waves	اختبار سريان الموجات الصوتية في الخرسانة والمواد
	Steel Tensile Stress Testing Machine (Instron)	قوة الشد ومعامل المرونة تحت توتر أحادي المحور للمعادن والمواد المركبة (حتى ٣٢ مم في القطر)
	Concrete Mixer	خلطة تصميمية
	Los Angeles Abrasion Machine	اختبار التآكل والبري للركام
	Compression Tension Machine	اختبارات الضغط من عينة الخرسانة القياسية
	Flexural Beam Frame	اختبارات الضغط من عينة الخرسانة القياسية
	Concrete Test Hammers	اختبارات الضغط من عينة الخرسانة القياسية بطريقة غير متلفة
	Concrete Impermeability Apparatus	تحديد نفاذية الخرسانة
	Automatic Vicat Apparatus	ASTM C187 الاتساق العادي و ASTM C191 توقيت تحديد الاسمنت الهيدروليكي
	Aggregate Crushing Value Apparatus	تحديد صلابة الركام
	Core Drilling Machine	استخراج القوالب الخرسانة



Surveying and Remote Sensing Laboratory

Courses Taught:

Surveying (1)

Surveying (2)

Graduation projects (491-492 CE).

Introduction:

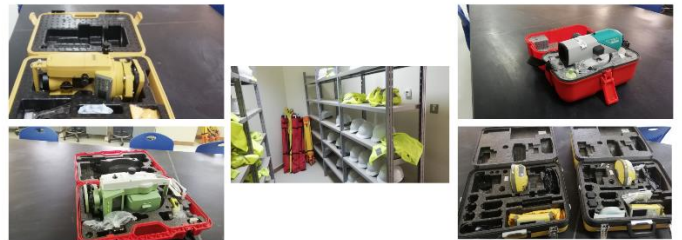
The Surveying and Remote Sensing Laboratory is well-equipped with all of the necessary instruments and tools to assist in the overall understanding and practical knowledge of students as they study field data collection techniques using both classic and modern instruments.

The surveying tools in the lab are used to prepare students for the practical aspects of Surveying I (261CE), Surveying II (462CE), and the graduation projects (491-492 CE).

Traditional surveying tools such as tapes, surveying compass, digital Planimeters, levels (automatic, digital levels) and their accessories, as well as digital Theodolites, are all available in the laboratory.

In addition, the laboratory has modern surveying equipment such as total stations with various accuracies and a Global Positioning System (GPS).

The training part of the surveying courses includes many experiments such as: Measurements of distances using different instruments. Measurements of angles and direction of lines. Measurement of height of points and its application. Drawing the profile and volume calculation. Point coordinates determination relative to local or international coordinates systems. Drawing of maps using the obtained coordinates. The Surveying Laboratory is



Facilities:

WiFi, Whiteboard, Wireless Multimedia Projector, PCs, Printer, etc.

equipped with the following
instruments/equipments:

Lab Items	Qty	Lab Items	Qty
Total Station with Prisma	3	Digital level With Rods	5
Global Positioning (GPS) System	2	Mechanical Planimeter	5
Digital Theodolite	3	Prism system	4
§Prismatic Compass	5	Tripod	5
Digital Distance Measuring Wheel	5	3- meter Leveling Rod	10
¹ Plumb bob Brass 12 oz	10	Digital level With Rods	5

Location :

Main building, Ground Floor.

Water Resources & Environmental Engineering Laboratory

Course Taught:

211 CE-3 Fluid Mechanic

312 CE- 3 Hydraulics

371 CE-3 Sanitary Engineering

The Environmental Engineering and Water Resources Laboratory is used for formal and informal courses, research activities, practical knowledge and research in natural environmental processes and hydraulic engineering. The laboratory is divided into two main branches, which are the branch of fluid mechanics and hydraulics, and the branch of sanitary and environmental engineering.

The fluid mechanics and hydraulic branch of the laboratory is utilized for :

- Pressure Gauge Calibration using Dead Weights
- Determination of Meta centric height of a floating body.
- Demonstration of Bernoulli's theorem,.
- Study of flow over Weir and Notches.
- Energy losses in bends elbows and fittings.
- Observation of the laminar, transition and turbulent regimen
- Study of flow through flow measurement apparatus.
- Determination of the centre of pressure, equivalent force and resultant force with different angle
- Calibration of a bourdon manometer
- Determination of the Meta centric height, centre of gravity of the float.
- To study the Impact of jet



- Type of flow in open channel
- Free flow under Sluice Gate
- Flow rate over Broad Crested weir
- Flow rate and weir head over Ogee-Crested Weir
- Hydraulic jump under ogee crested weir
- Free flow under radial gate
- Submerged flow under Radial Gate
- Elements for Energy Dissipation
- Series coupling of two pumps with the same characteristics
- Parallel coupling of two pumps with the same characteristics
- Centrifugal Pumps Characteristics

Fluid mechanics and Hydraulics Lab Items :

Lab Items	Qty
Pelton Turbine	1
Radial flow Turbine	1
Series / Parallel Pumps	1
Centrifugal Pump Characteristics	1
Pipe Surge and Water Hammer Apparatus	1
Energy losses in Bends	1
Orifice and Free Jet Flow	1
Metacentric Height	1
Energy losses in pipes	1
Bernoulli's Theorem Demonstration	1
Flow Meter Demonstration	1
Impact of a Jet	1
Osborne Reynolds Demonstration	1
Cavitation Demonstration	1
Dead Weight Pressure Gauge Calibrator	1
Orifice Discharge	1
Hydrostatic Pressure	1
Laminar Flow Visualization Unit	1
Properties of fluid Apparatus	1
Particle Drag Co-efficient	1
Hele - Shaw Apparatus	1
Hydrology Apparatus	1
Drainage and Seepage Tank	1
Lysimeter	1
Infiltration Apparatus	1

The sanitary and environmental engineering branch of the Lab. is used to teach concepts and perform research related to sanitary and environmental engineering, water and wastewater reclamation and related fields. The laboratory is also utilized for:

- Determination of Total Dissolved Solids (TDS) in Water sample
- Determination of Total Suspended Solids (TSS).
- Determination of Settle able Solids (SS).
- Determination of Volatile Suspended Solids (TDS).
- Measuring pH of Water/Waste water
- Measuring Electrical Conductance.
- Measuring Turbidity of Water/Waste water
- Measuring total alkalinity of a given water sample and type of alkalinity
- Measuring total hardness of a given water sample.
- Determining the type of hardness
- Measuring the Dissolved Oxygen in a given water/Waste water sample.
- Measuring Biological Oxygen Demand (BOD) of a given effluent sample
- Measuring Chemical Oxygen Demand (COD) of a given effluent sample

Environmental engineering Lab. Item

Lab Items	Qty
Membrane Filters Gridded (47-mm) with absorbent pads	4
Filter Forceps	6
Glass Fiber filters (47- mm)	4
Glass Fiber filters (25-mm)	4
Small Oven	1
Medium Oven	1
Analytical balance Dual range	1
Ultraviolet-Visible Spectrophotometer	2
Table top Sterilizer	1
Muffle furnace	1
Dissector Cabinets.	2
PHPH Meter - Benchtop	3
Turbidity Meter- Benchtop	2
Conductivity Meter - Benchtop	2
Dissolved Oxygen Meter-Benchtop	2
Magnetic Stirrer Hot plate with Stand	4
Magnetic Stir bars	2
Stir Bar Retriever	6
Thermometers	6
Vacuum/Pressure Pump	2
Plastic Petri Dish	6
Analytical balance single range	1
Top loading electronic balance single range.	1
Jar test Apparatus	2
Biochemical Oxygen Demand (BOD) incubator for 5-day BOD test. BOD -	1
Laboratory Chemical Cart.	2
Vacuum Filter Holder Assembly - Glass, 47-mm	4
Multiunit digestion heater	1
Multiunit Counter Top distillation Units	1
Water distillation unit. Single/Double distilled.	1
Fecal coliform incubator water bath	2

Location:

Main building, Ground Floor.