

## University of Mosul / Colledge of Engineering



Colledge of Engineering  
Environmental Engineering Department  
Environmental Engineering Laboratory



### **1- Environmental laboratory:**

This laboratory lies within the main campus and it is considered one of the newest labs in the college of engineering. The lab has most of the devices and instruments to measure the pollutants and perform the water and wastewater tests in addition to networks pipes and potable water filtering tests. All the devices and instruments are maintained and calibrated periodically. The laboratory presented a preliminary guide to the Central Organization for Standardization and Quality Control COSQC in Iraq as the first step to get the quality certification according to the Arab Union standards. Most lab devices were calibrated by the COSQC by the end of 2011 and got the calibration certificates. The lab is well ventilated and conditioned and the work environment is well organized.



The lab work includes:

- Perform water tests, including, raw, drinking, irrigation, wastewater, ...etc, and compare it to the standards.
- Perform construction materials tests, including, cement, pipes, tiles, gravel, and filters for different government agencies and private sector and check their suitability to be used in construction and their environmental impact .
- Provide environmental and engineering consulting for government agencies and the private sector.
- Provide workshops through Nineveh Governorate training center- the general directorate of human resources for government employees.
- Perform research for the faculty and graduate students.
- Perform tests for undergraduate projects.



Management quality policies in the lab.:

- All lab tests are according to ISO/IEC 17025/ 2005 standards and other specific requirements by the national accreditation agency in addition to the client needs .
- The lab manager and the staff ensure that all tests are performed professionally and without bias.
- The qualified lab staff- technical and management- are paid salaries regardless of the number of tests so that will not fall under any financial and economical pressure that may affect the results of the tests.
- The lab is structured in a way that every person has his own responsibility with a replacement that has the same efficiency to perform the required tasks. The financial and administrative department makes sure that all tests and final reports are documented and signed by the staff/ replacement that performed the tests .

- Only authorized personnel are allowed to the lab and the tests are performed discreetly and without bias.
- No direct contact is allowed between the clients and the lab staff .
- Any attempt to affect the tests' results is dealt with in a strict and professional way according to the lab regulations. An investigation will take place and if there is any bias- the staff participating will face an administrative penalty and the client causing the problem will be denied any lab service in the future .



## Laboratory tests:

Drinking water tests	Approved specification	Devices
PH-value	Standard Specifications No. 417 of 2009 The second update on drinking water issued by the Central Organization for Standardization and Quality Control	(PH meter)
Electrical Conductivity (EC)		Device of (Ec)
Turbidity		Device of (Turbidity)
Total Hardness		
Hardness Calcium		
Calcium concentration (Ca)		
Magnesium concentration (Mg)		
Chloride concentration (Cl)		
Sulphate (SO <sub>4</sub> )		
Total number of bacteria		Autoclave
Coliform Bacteria		Autoclave
Alkalinity and Acidity		
Nitrates (NO <sub>3</sub> )		Color spectrophotometer
Phosphate (PO <sub>4</sub> )		Color spectrophotometer
Biochemical Oxygen Demand (BOD)		Incubator
Chemical Oxygen Demand (COD)		Device of (COD)
Suspended solid matters and dissolved solid matters		Burning oven, Drying oven, Accurate balance

Industrial water tests	Approved specification	Devices
PH-value	Iraqi Specification of 1998	(PH meter)
(EC) Electrical Conductivity		Device of (Ec)
Turbidity		Device of (Turbidity)
Total Hardness		
Calcium concentration (Ca)		
Magnesium concentration (Mg)		
Chloride concentration (Cl)		
Sulphate (SO <sub>4</sub> )		
Alkalinity and Acidity		
Nitrates (NO <sub>3</sub> )		Color spectrophotometer
Phosphate (PO <sub>4</sub> )		Color spectrophotometer
Biochemical Oxygen Demand (BOD)		Incubator
Chemical Oxygen Demand (COD)		Device of (COD)
Suspended solid matters and dissolved solid matters		Burning oven, Drying oven, Accurate balance
Heavy metals		Multi-tests device

Sand and gravel tests for filters	Approved specification	Devices
Sieve analysis test	Iraqi Standard Specifications No. 1555 of 2000	Standard sieves, Drying oven
Granular density		Sensitive electronic balance, volumetric cylinder
Curing test		cylinder, drying oven
Weight loss due to acid		Standard solutions

Ceramic tests	Approved specification	Devices
Weight loss due to acid		Sensitive electronic balance
Pipes tests	Approved specification	Devices
Anhydrous acetone test	Iraqi Specifications (No. 1491)	
Toxicity test (Heavy metals)		Atomic absorption testing device

Cement material tests	Approved specification	Devices
Percentage of silica	American international standards specifications (ASTM-C150)	Burning oven Drying oven Hood electronic balance Ceramic and platinum dish Filter papers Burettes Magnetic mixers
Percentage of aluminum		
Percentage of Iron		
Percentage of Calcium		
Percentage of magnesium		
the rate of loss by burning		
the gypsum percentage		
the percentage of insoluble substances		
the percentage of free lime		



**The following table shows the numbers and symbols of the devices available in the Environmental Engineering Laboratory:**

Device name	No. of devices	Serial number	symbol
Air intake pump	1	1-1-13	MENEV
Jar test device	1	1-1-3	MENEV
Air compressor	2	2-1-31 2-2-31	MENEV
Autoclave	2	2-1-5 2-2-5	MENEV
Sterile	2	2-1-6 2-2-6	MENEV
Atomic absorption device	1	1-1-33	MENEV
pH meter	1	1-1-8	MENEV
Water bath	1	1-1-9	MENEV
Centrifuge	1	1-1-10	MENEV
Spectrometer (UV)	1	1-1-34	MENEV
Magnetic mixer	2	2-1-12 2-2-12	MENEV
Cooling room	1	1-1-35	MENEV
microscope	1	1-1-36	MENEV
Stone burning oven	1	1-1-37	MENEV
Water distillation device	2	2-1-14 2-2-14	MENEV
Incubator	1	1-1-20	MENEV
Sensitive balance	3	3-1-15 3-2-15 3-3-15	MENEV
Turbidity device	1	1-1-16	MENEV
Dissolved oxygen (DO) meter	1	1-1-17	MENEV
Hardness remover	2	2-1-38 2-2-38	MENEV
balance	1	1-1-43	MENEV
(COD) device	2	2-1-40 2-2-40	MENEV
Ions measuring device	1	1-1-11	MENEV
Photometric flame spectrometer	1	1-1-2	MENEV
Electrical conductivity device	1	1-1-42	MENEV

Phosphate measuring device (Spectro photometer)	1	1-1-44	MENEV
Heating heater (Hood)	2	2-1-45 2-2-45	MENEV
Multimeter device	1		MENEV