

University of Mosul
College of Engineering



Guide of Department of Dams & Water resources Engineering



9 الصناعة والابتكار
والبنية التحتية



2025 Edition



Uomosul.edu.iq/engineering/



Iraq-Mosul-Al Majmoaa Street



College of Engineering





Introduction

Dams and Water resources engineering department at the University of Mosul is one of the pioneering departments established within the faculty of Engineering. This guide will provide an overview of the department, facilities, laboratories, academic activities, events and community service initiatives. In addition to Bachelor's degree, the department offers postgraduate degree in three topics:

- 1- Hydrology
- 2- Hydraulics
- 2- Irrigation

This guide is available in both Arabic and English Sub. This work was prepared under the guidance of the Dean of the Faculty of Engineering, Professor Dr. Abdul Rahim Ibrahim Jassim, and under the supervision of the Head of the Department of Dams and Water Resources Engineering, Assistant Professor Dr. Omar Mekdad Abdul Ghani.

2025-2024



Department Management

Ass. Prof. Dr. Omar Mekdad Abdul-Ghani

- **Head of dams and water resources engineering department**
- **Specialty: Water resources/ Hydrology**

Lec. Dr. Ahmed Ali Mohammed

- **Department Decision**
- **Specialty: Water resources / Irrigation**



Department Laboratories

Hydraulic Laboratory

- **Lab supervisor: Ass.Lec.Ahmed younes**

Soil and Water Physics Laboratory

- **Lab superviisor: Lec.Dr.Abdul-aziz Abdul-bast Mohammed**

Computer Laboratory

- **Lab Supervisor: Ass.Lec.Omar Kanaan Taha**

Survying Laboratory

- **Lab Supervisor: Ass.Lec. Alaa Ismail Naser**



Vision:

The vision of DWR is to be a pioneer and leader in water development studies in Iraq and plays an essential role in controlling these studies and investing them in the field of irrigation and electrical generation, storage and distribution of water in dam reservoirs, and water resources engineering. DWR aims to achieve an advanced level of education in the field of dam engineering, water resources that meet the country's need for engineering alumni to secure the completion of future plans in the fields of work in which the department's specialization is part of it.

Mission:

Qualify competent engineers to work in the field of water resources, prepare alumni with distinct capabilities to meet the current and future challenges related to the optimal use of water resources and face the drought phenomenon, provide the country and society with specialists who hold higher degrees in the hydraulic, hydrological and irrigation specialties to benefit from their scientific expertise, develop students 'performance and strategies to deal with real world problems through constructive and advanced scientific thinking, adopt the distinguished and creative ideas of students and encouraging them to work as a team, and maintain communication with department's alumni through inviting them to seminars, scientific conferences, and continuing education programs.

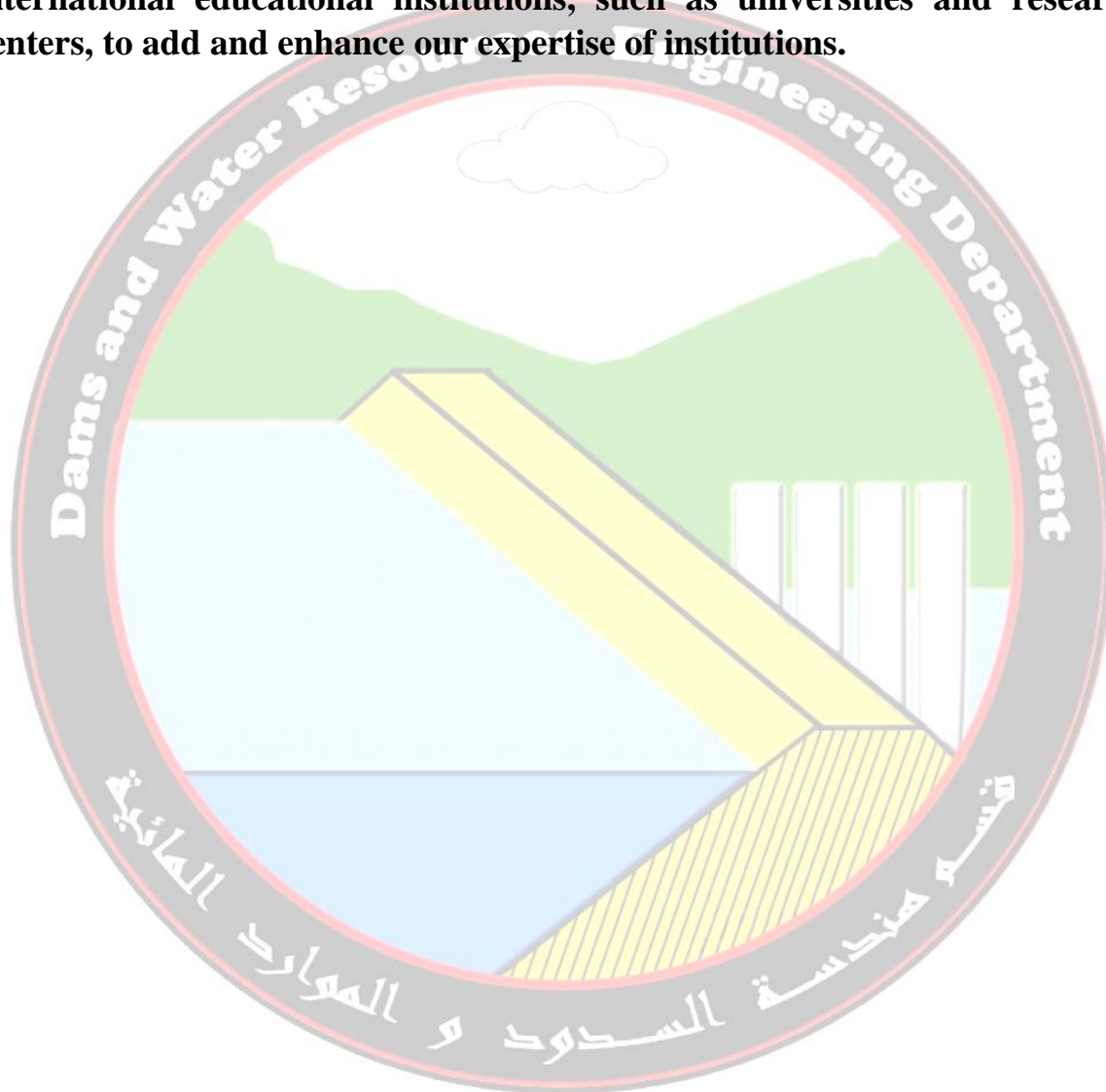
Goals:

1. Provide well qualified graduates with considerable practice and scientific foundations in the aspects of the water resources subjects to serve and participate in achieving the needs and goals of the socio-economic development of the country.
2. The graduates were able to analyze and design the hydraulic and irrigation structures. In addition, to evaluate these projects by using modern specialized programs or built physical models.
3. Providing graduates with basic skills in managing projects, solving problems, and reports preparation related to water resources projects.



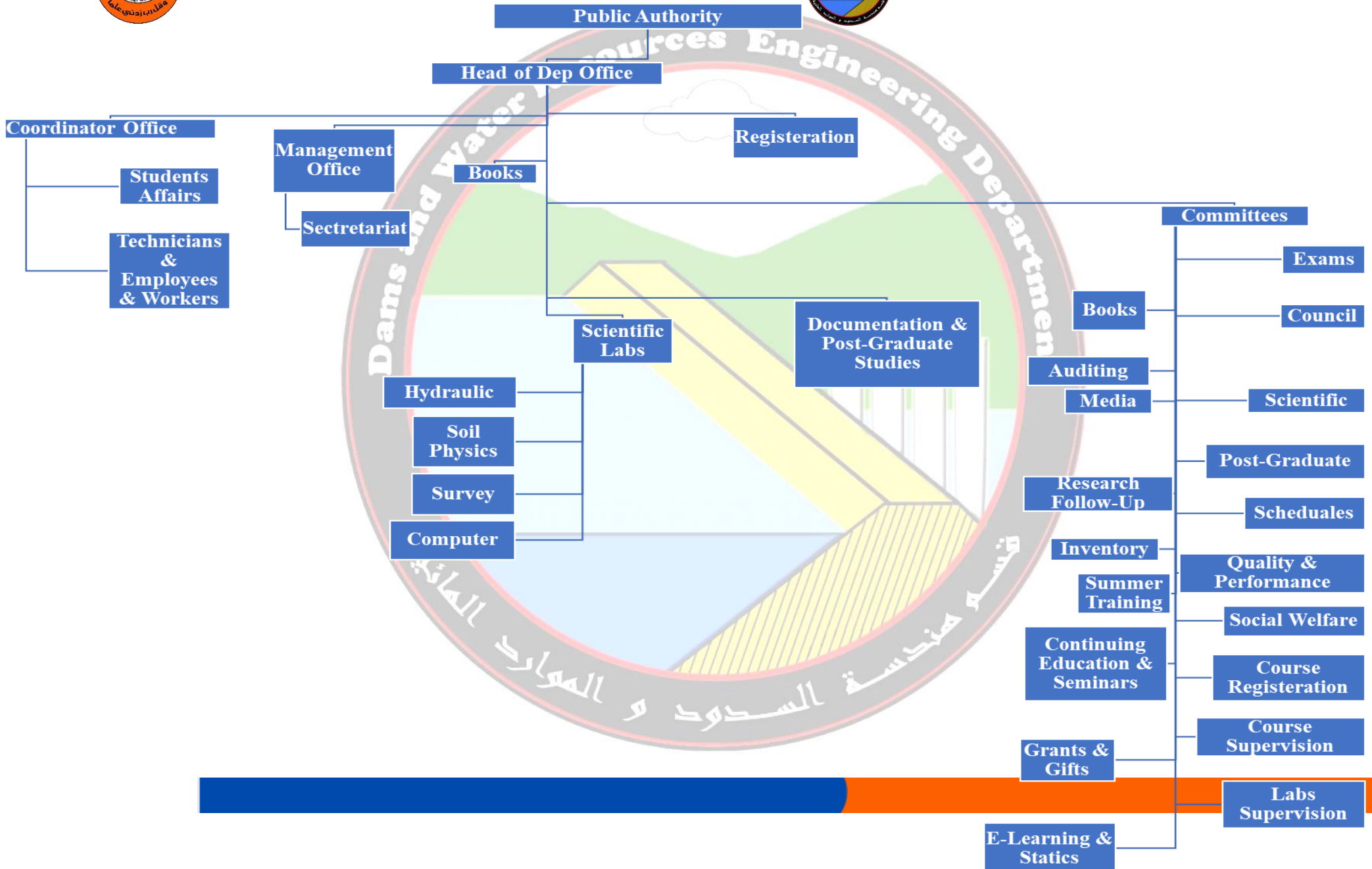
4. To provide the graduates with skills and scientific bases to be able to continue in higher education.

5. Sharing and expanding our potential by communicating with the related international educational institutions, such as universities and research centers, to add and enhance our expertise of institutions.





Department of Dams & Water resources engineering





Responsibilities

Head of Department: Managing the department in scientific, administrative, cultural, educational, financial, and students' affairs. Supervised on educational techniques and process, prepare a seasonally and annually reports on departments activities and raise it to the dean of the college. Distributing the duties on the department faculty and staff and issued administrative orders to do so.

Department Decision: Distributing and organizing the classes on the faculty members, follow up the student absence and the seminars.

Department Council Committee: Supervision on the department education program. Follow up and achieve the scientific plan and the development of faculty and staff.

Scientific and Graduate Studies Committee: The committee in contribution with the head of department prepare the curricula and upgrade them. The committee also review the promotion documents for faculty and check the research plagiarism. Follow up all graduate student-related problems: select qualified exam committee, prepare a committee for graduate students' extension requests.

Examination Committee: Follow up the mid-term and final exams, organize the observation schedule and observers. Receiving the exam questions and the grades from the faulty and organizing them securely. Prepare statistics to the final grades and provides the pass and fail percentages for examiners, preparing make-up exams.



Checking Committee: It works simultaneously with the examination committee during exams and results. The committee members check the marks received from the faculty.

Graduation Projects Committee: Collecting the suggested projects prepared by the faculty, organize them and present them to students. Preparing committee for discussing the projects after the students have completed their projects.

Continuous Education and Seminars Committee: Following up the continuous education session prepared and presented by department faculty for engineering who are working industrials. Additionally, following up the conferences and seminars prepared by the department.

Summer Training Committee: Prepare official letter specifically for junior students to admit them to be trained at the industrials. monitoring the students during training. Receiving reports prepared by students after they completed their training.

Media Committee: The committee members report all scientific and social activities via that the department make them frequently. They are usually done via photos and posters.

Books Distribution Committee: Distributing books to students at the beginning of each academic year and receive them at the end of the academic year. Organizing a list for borrowed books by faculty and graduate students.

Classes Schedule Committee: The committee members prepare classes schedule for undergraduate and post graduate programs.



Archiving Committee: Archiving masters theses and doctoral dissertations electronically for all area of concentrations under civil engineering major. Additionally, archiving the high diploma and final level projects electronically.

Inventory Committee: An inventory for the furniture and equipment available at the department rooms and laboratories

Social Solidarity Committee: Following up the social cases for the department students and staff who needs financial support.

Registration Committee: Receiving and registering new students at the beginning of each new academic year. Registering students for all academic levels and following up student statuses during academic year such as transferring, hosting, postponing, etc. Preparing students lists for all academic levels according to the classrooms.

Department Management: Reporting incoming official letters, sending out the official letter released from the head of department. Issued the official letters, and organization of issued and received official letters.

Printer: Typing, Printing, and reporting the official letter and reporting the student's daily attendance. Prepare a monthly table for the percent of student absence. Receiving and sending emails from and to the department management.

Library: Receive master thesis and doctoral dissertations electronically and hardcopies for graduated students who graduated recently Organize the work for borrowing books and theses and dissertations. Additionally, organize the Engineering software's CDs.



Teaching staff

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Department Building

The Department of Dams and Water Resources Engineering is one of the oldest scientific departments affiliated with the College of Engineering at the university of Mosul, as it was established in 1967. The study in the department includes well-studied curricula distributed over four years, which guarantee the graduate information that qualifies him to work in the public and private sectors as a successful engineer. The number of teaching staff in the department currently amounts to 30 teachers distributed on 16 PhD and MSc degrees.

It awards a Bachelor of Science in Dam and Water Resources Engineering. The department also awards higher diploma studies certificates as a preliminary stage for master's studies, and also awards master's and doctoral degrees.





The Higher Diploma aims to develop the skills of engineers in government departments and the private sector, especially those who were not successful in obtaining high grades that would qualify them to study for a Master's degree. A special curriculum has been designed to prepare them with the latest scientific developments. The Higher Diploma student must also engage in a specialized study topic under the supervision of one of the department's lecturers with advanced academic degree.

Both the Master's and PhD studies include specializations in hydraulics, hydrology and irrigation. The Master's degree lasts two years, the first year is preparatory and the second is for research. After that, the graduate is awarded a Master of Science degree in Dam Engineering and Water Resources. As for the PhD studies, they require three years, including one preparatory year and two years for research. The graduate is then awarded a PhD in Dam Engineering and Water Resources.





The teaching system is based on the system of courses and semester lessons. The study materials are characterized by their theoretical nature, reinforced by the practical application aspect that is implemented in the laboratories affiliated with the department, such as the hydraulics laboratory, soil physics, surveying, and the computer laboratory, in addition to the materials testing and soil mechanics laboratories in the Civil Engineering Department. The department's lecturers seek to keep pace with development and modernization by reviewing the latest published research and books written in the field of dam engineering and water resources, or by participating in scientific conferences and seminars held inside and outside the country, and to disseminate the concepts of rationalizing consumption in the fields of irrigation by using modern technologies such as sprinkler and drip irrigation.

The department also communicates, through official channels, with Arab and international universities or specialized international organizations to conclude scientific agreements with them or obtain training courses for professors and graduate students. The department's lecturers participate in the advisory and research teams formed by the engineering consulting office in the college.

The Department of Dams and Water Resources Engineering, through its staff, has a distinguished role in building good and strong relationships with the rest of the university's colleges and affiliated scientific centers with similar specializations in conducting joint research or joint supervision of master's and doctoral theses or participating in continuing education courses.



It has a long history through the participation of many of its members in government committees and bodies that provide their services to the community, such as the Engineers Syndicate and holding continuing education courses for engineering staff in government departments to inform them of the latest technologies used in planning and managing water resources in an optimal and sustainable manner.

Table explain details of Dams & Water resources department building.

S	Type	Number	Area
1	Small Halls (Primary Studies)	7	30
2	Great Halls (Stands)	2	110
3	(Primary Studies)	1	80
4	Post-Graduate Halls	1	110
5	Meetings rooms	1	1040
6	Hydraulic & Surveying Labs	1	250
7	Soil Physics Labs	1	180
8	Computer Labs	1	110
9	Studio	14	30
10	Professors room	1	450
11	Ephorate's Hall	1	450
12	Tigris Hall	1	35
13	Registration room	1	100
14	Head of department room	1	35



Department Laboratories

The Department of Dams and Water Resources Engineering is linked to four laboratories that are distinguished by their scientific and advisory activities. These laboratories contain a large number of devices that are subject to permanent maintenance.

These laboratories contribute to the completion of postgraduate research and contribute to raising the scientific research movement of professors.

The department's laboratories are managed by a number of professors who are distinguished by their scientific competence and field experience in their specializations.

1. Hydraulic Laboratory

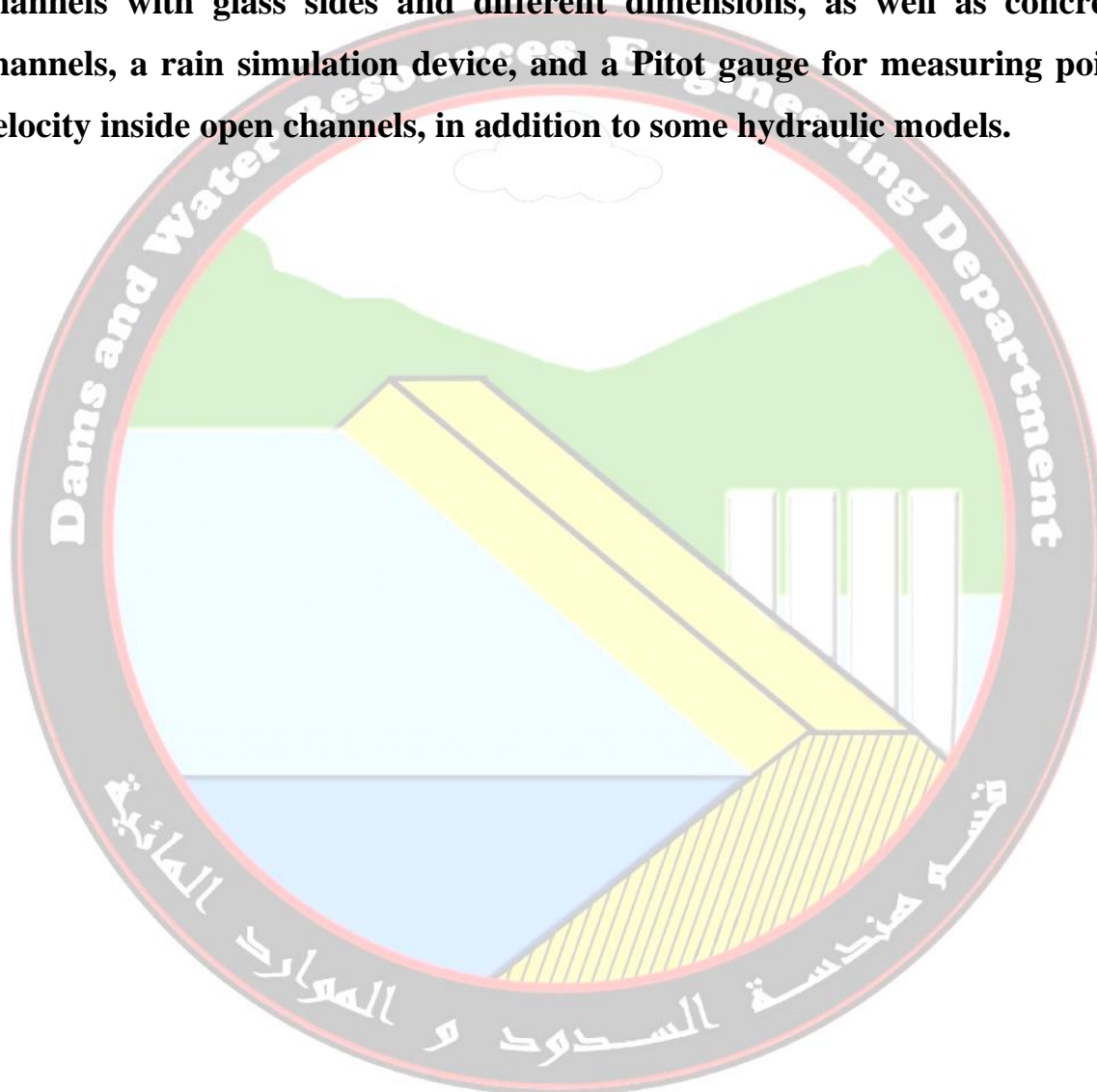
The Hydraulics Laboratory is one of the oldest laboratories in the College of Engineering and is affiliated with the Department of Dams and Water Resources Engineering. The laboratory area is (1040 m²) and includes rooms for the laboratory staff, the laboratory supervisor, the technical officer and the technical staff, in addition to the laboratory's service facilities.

In the hydraulics laboratory, experiments are conducted for undergraduate students (second stage), as the laboratory contains special devices for conducting fluid experiments that depend on the direct application of various theories, including (finding the center of pressure - classifying flow in pipes, Bernoulli's equation, Venturi scale, extrusion stroke, friction coefficient for pipes, friction losses in accessories, flow through a sharp



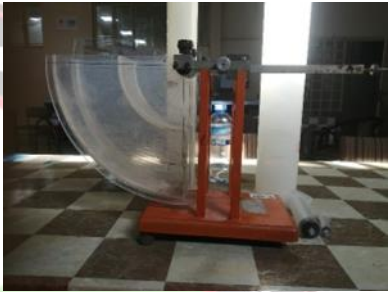


opening, submersible dam, hydraulic jump, vortex flow and viscosity of fluids).

The laboratory also contains devices and equipment for postgraduate students' research and teaching. The laboratory includes many iron channels with glass sides and different dimensions, as well as concrete channels, a rain simulation device, and a Pitot gauge for measuring point velocity inside open channels, in addition to some hydraulic models.







Apparatuses Description of Hydraulic Laboratory




Apparatuses for Undergraduate Students

No.	Device Name	Device Description	Device Picture
1	center of pressure	A device consisting of two quarter-circular cylinders that are graduated and also have weights and are used in designing dam gates	
2	Classification of flow in pipes	It is a device consisting of a pump and a tube with a diameter of 1 cm to determine whether the flow is laminar, transitional or turbulent	
3	Bernoulli's equation	It is a device consisting of piezometers and applications of Bernoulli's equation, the acute opening and the submerged dam	

Apparatuses Description of Hydraulic Laboratory

No.	Device Name	Device Description	Device Picture
4	Venturi	It is a device consisting of piezometers to know the rise and fall when there is a decrease in the pipe and thus calculate the discharge	
5	Impact of Jet	A device consisting of weights and flat and hemispherical plates to determine strength and which plate is best	
6	coefficient of friction for pipes	A device consisting of pipes, connections and curves to determine the values of losses in pipes without any bends	
7	Friction losses in accessories	A device consisting of pipes, connections and curves to determine the values of losses in .secondary accessories	

Apparatuses Description of Hydraulic Laboratory

No.	Device Name	Device Description	Device Picture
8	flow through a sharp opening	<p>It is a device consisting of a cylinder with graduations to know the water heights and it has a fixed and variable water height and it contains a graph paper to know the values of X and Y when the water flow from the sharp opening is curved and also to calculate the discharge coefficient, velocity and contraction</p>	
9	Weir	<p>A device consisting of a pump used to measure discharge and having a weir with a rectangular notch and a triangular notch</p>	
10	Hydraulic Jump	<p>A device consisting of a pump and a small glass channel in addition to small gates mounted on the channel from above</p>	

Devices for post-graduate students

No.	Device Name	Device Description	Device Picture
1	Iron channels with glass sides and different dimensions	Glass channels of different dimensions, the discharge is calibrated by a weir placed at the end of the channel and is used by graduate students	
2	Concrete channels	Concrete channels of different dimensions, the discharge is calibrated by a weir placed at the end of the channel and is used by graduate students	
3	Rain simulator	This device consists of a pump and drippers on top to simulate rain	
4	Some hydraulic models	These are models that can be mounted on some glass channels	



2-Soil Physics and Water Laboratory

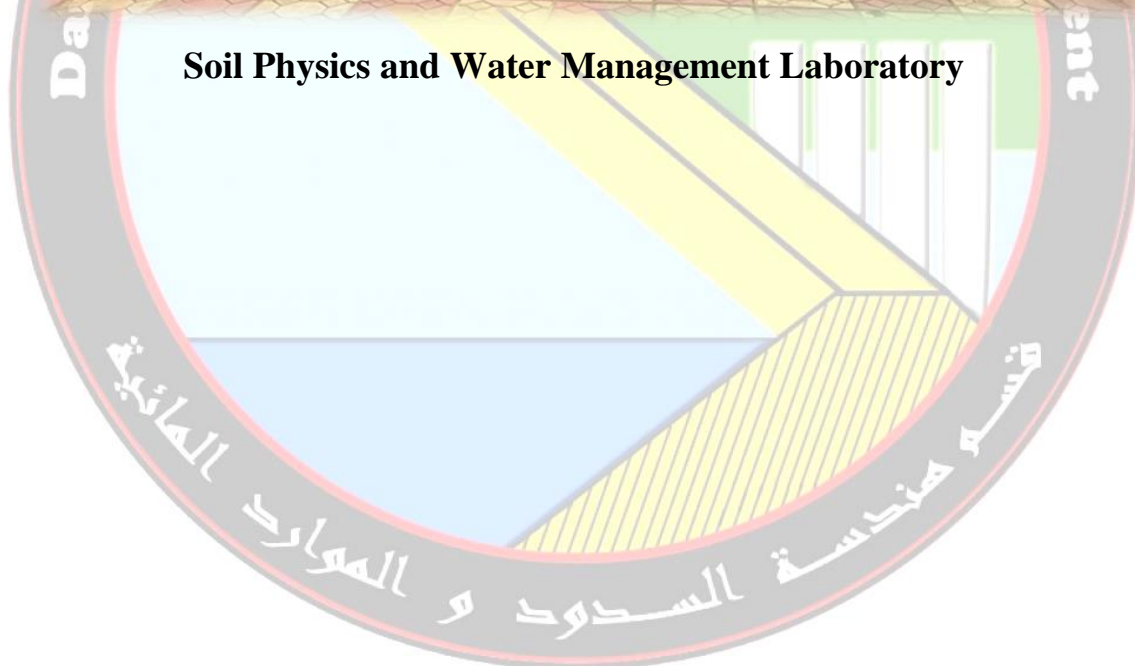
it is one of the laboratories of the Department of Dams and Water Resources Engineering of the College of Engineering at the University of Mosul. The laboratory was established in 1978 on an area of 250 m² and was equipped with devices for testing and analyzing soil and water and is concerned with the study of soil and its physical characteristics and classification in addition to the movement of water in it. The laboratory includes a spacious classroom for giving practical lessons and conducting laboratory experiments for students of preliminary studies, and the laboratory contains a room for the laboratory official, a rest for the teaching staff, and a store for storing devices and chemicals, and the laboratory was damaged to some laboratory equipment during the military operations of the city in 2017 and then it was rehabilitated and became ready to receive students and conduct experiments in it.

Tests that can be performed in the laboratory:





Estimation of the volumetric distribution of soil separations – Measurement of water infiltration in the soil – Measurement of soil permeability and hydraulic conductivity – Estimation of soil moisture content – Measurement of soil moisture tension – Calculation of bulk density of soil – Calculation of the soil particle density – Measurement of soil pH – Determination of dissolved salts in the soil. The laboratory also provides scientific assistance and advice to graduate students from outside the department.







Soil Physics and Water Management Laboratory






Apparatuses Description of Soil Physics and Water Laboratory

No.	Device Name	Device Description	Device Picture
1	Hydrometer	To find the percentage of soil separations and granules	
2	Double Ring	Measurement of water infiltration in soil	
3	Soil pH device	Measuring of soil pH (acidic and basic)	
4	Permeability measuring device (constant head)	Measurement of water permeability in coarse soils	





Apparatuses Description of Soil Physics and Water Laboratory

No.	Device Name	Device Description	Device Picture
5	Electric oven	Drying soil samples	
6	Water distillation device	Get distilled water	
7	Electric Shaker	Shaking, thawing and homogenizing soil granules	
8	Soil vacuum	Extraction of water from the soil	

Apparatuses Description of Soil Physics and Water Laboratory

No.	Device Name	Device Description	Device Picture
9	Permeability measuring device (falling head)	Measurement of water permeability in heavy soils	
10	Tensiometer	Measurement of moisture tension in soil	
11	Water bath	heating samples or heating chemicals	

Apparatuses Description of Soil Physics and Water Laboratory

No.	Device Name	Device Description	Device Picture
12	Electrical Conductivity	Measurement of salt concentration in soil extract 	
13	Sensitive balance	To measure weights	
14	Centrifuge	Sedimentation	

3- Computer Lab

The Department of Dams and Water Resources has three computer laboratories. The first is a graduate studies laboratory, the second is an undergraduate studies laboratory located on the ground floor, and the third was an undergraduate studies laboratory on the second floor. Unfortunately, the third laboratory was completely destroyed in a fire, along with all its contents. While the laboratory has been rebuilt, it remains unequipped with the necessary computers and furniture required for operation and use.



Computer Lab Details

No.	Laboratory Name	Number of Computers	Weekly Hours	Engineers	Electronic Displays
1	Preliminary Studies Laboratory (Ground Floor)	32	18	0	0
2	Graduate Studies Laboratory	0	0	0	0
3	Preliminary Studies Laboratory (Second Floor)	0	0	0	0

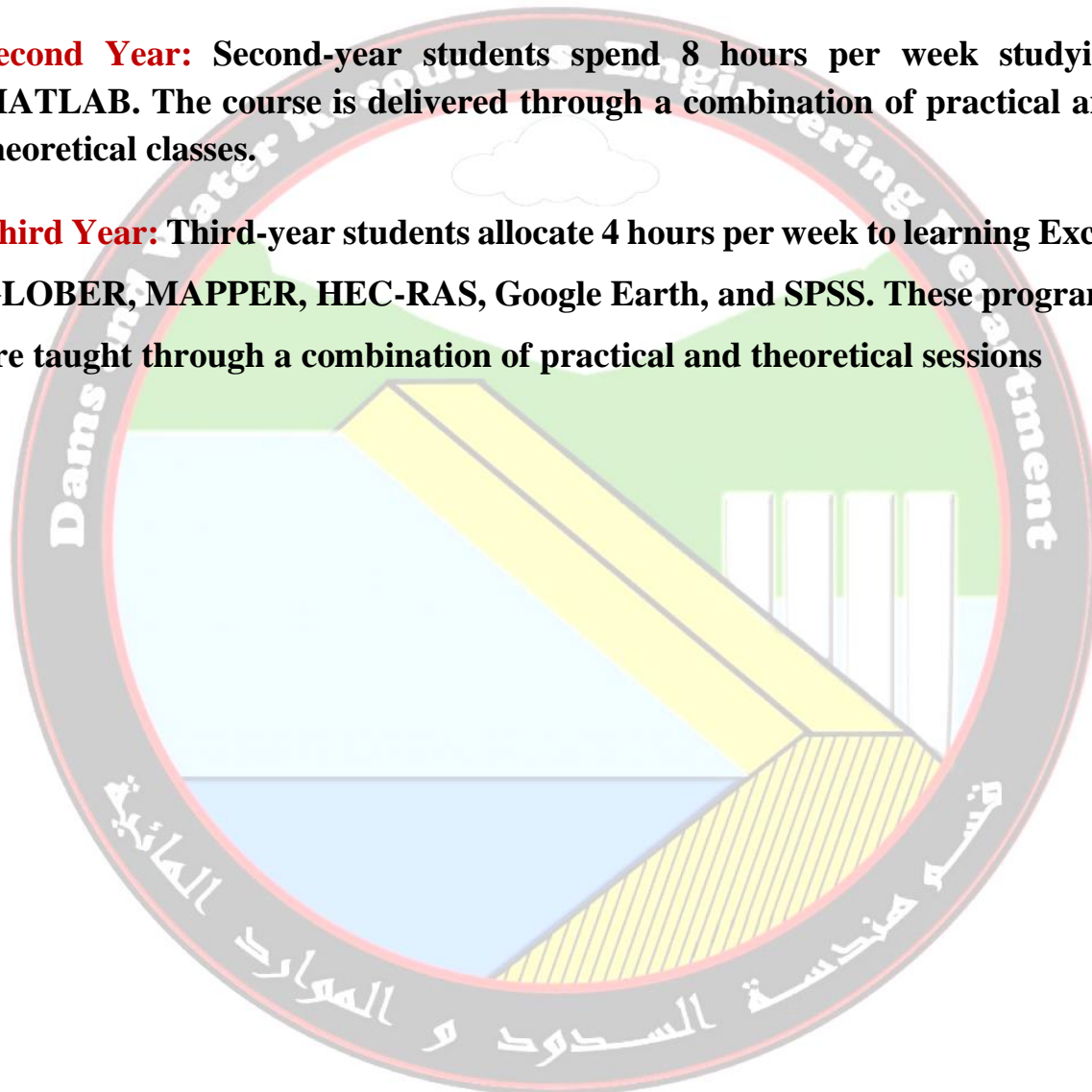


Laboratory Usage Hours and Curricula:

First Year: Students dedicate 6 hours per week to learning AutoCAD and Microsoft Office Suite (Word, Excel, PowerPoint, and Internet). These programs are taught through a combination of practical and theoretical sessions.

Second Year: Second-year students spend 8 hours per week studying MATLAB. The course is delivered through a combination of practical and theoretical classes.

Third Year: Third-year students allocate 4 hours per week to learning Excel, GLOBER, MAPPER, HEC-RAS, Google Earth, and SPSS. These programs are taught through a combination of practical and theoretical sessions





4-Surveying Lab

Established in 1964 and equipped with state-of-the-art surveying instruments from Germany and China, this specialized laboratory was dedicated to the Department of Dams and Water Resources Engineering on October 1, 2003. It facilitates a range of fundamental surveying experiments for undergraduate students, including:

- Establishing a straight line
- Constructing a perpendicular to a straight line from a point on the line
- Constructing a perpendicular to a straight line from a point outside the line
- Levelling a building facade
- Levelling an entire building
- Introductory lectures on leveling and instrument setup
- Creating longitudinal and cross-sectional profiles
- Grid creation
- Radiation surveying
- Balancing measurements
- Introductory lectures on the theodolite and instrument setup
- Levelling a building façade
- Levelling an entire building
- Bearing calculations

The laboratory is also equipped with a diverse array of instruments, providing students with comprehensive training in surveying operations and equipping them with the essential skills required for a career in surveying. These instruments can be categorized as follows:

Group 1: Modern electronic equipment, such as total stations, as well as instruments for measuring directions and angles, including theodolites and levels. A planimeter for measuring areas is also available.



Group 2: Traditional surveying equipment, including survey poles, measuring tapes, and horizontal rulers. The laboratory is also equipped with all necessary safety equipment.

The following table provides a detailed inventory of the equipment available in the laboratory, including the manufacturer and the condition of each instrument.

Surveying Lab Details

Instrument	Serial Number	Origin	Primary Use	Quantity	Condition
Level	40089	Chinese	Training students in surveying practices	20	Average
Theodolite	40090	Chinese	Training students in surveying practices	12	Average
GPS	70500	Taiwanese	Training students in surveying practices	8	Moderate
Total Station	70536	Japanese	Training students in surveying practices	2	Good
Planimeter	1315322	Japanese	Training students in surveying practices	4	Average
Power fix	1315325	German	Training students in surveying practices	2	Good



Apparatuses Description of Surveying Laboratory

No.	Device Name	Device Picture
1	Leveling instrument base	
2	Safety equipment like goggles and helmets	
3	Vests that can be used in surveying work	

Apparatuses Description of Surveying Laboratory

No.	Device Name	Device Picture
4	A set of rods, tapes, and a level	
5	A first-aid kit for student safety	
6	Planimeter	

Apparatuses Description of Surveying Laboratory

No.	Device Name	Device Picture
1	(Total station)	
2	Theodolite	



University of Mosul / College of Engineering / Department of Dam Engineering and Water Resources
2025-2024 Course Catalog
First and Second Stages / Polonia System

		Republic of Iraq - Ministry of Higher Education and Scientific Research University of Mosul Bachelor's degree in Dams and Water Resources Engineering (First cycle) Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25hr Program Curriculum (2024 - 2025)					جمهورية العراق - وزارة التعليم العالي والبحث العلمي جامعة الموصل بكالوريوس في هندسة السدود والموارد المائية (الدورة الأولى) أربع سنوات (ثمانية فصول دراسية) - 240 وحدة ائتمانية - كل وحدة ائتمانية = 25 ساعة المتاهج الدراسي للعام 2024-2025												
Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)					Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)								Semn (hr/w)
UGI	1	1	DWRE 111	Mathematics I	الرياضيات I	English	3	1			2	3	93	82	175	7.00	B		
		2	DWRE 112	Engineering Mechanics I	الميكانيك الهندسي I	English	2	1			2	3	78	72	150	6.00	B		
		3	DWRE 113	Engineering Drawing	الرسم الهندسي	English			6			3	93	57	150	6.00	B		
		4	UOM 101	Arabic	اللغة العربية	English	2					3	33	17	50	2.00	B		
		5	DWRE 114	Introduction to Water Resources Engineering	مقدمة في هندسة الموارد المائية	Arabic	2	1				3	48	27	75	3.00	C		
		6	UOM 103	Computer	حاسوب	English	1		2			3	48	27	75	3.00	B		
		7	DWRE 117	Hydrogeology	هيدروجيولوجي	Arabic	2	1				3	48	27	75	3.00	S		
Total Weekly Hours							28	12	4	8	0	4	0	21	441	309	750	30.00	
UGI	2	1	DWRE 121	Mathematics II	الرياضيات II	English	3	1			2	3	93	82	175	7.00	B		
		2	DWRE 122	Engineering Mechanics II	الميكانيك الهندسي II	English	2	1			2	3	78	72	150	6.00	B		
		3	DWRE 123	Computer Drawing	الرسم بواسطة الحاسوب	English			6			3	93	57	150	6.00	B		
		4	DWRE 124	Engineering Statistics	الإحصاء الهندسي	English	1				2	3	48	52	100	4.00	B		
		5	DWRE 125	Water Quality and Pollution	نوعية المياه والتلوث	Arabic	1		2			3	48	27	75	3.00	S		
		6	UOM 104	Human Rights and Democracy	الديمقراطية و حقوق الانسان	Arabic	2					3	33	17	50	2.00	B		
		7	UOM102	English	اللغة الإنكليزية	English	2					3	33	17	50	2.00	B		
Total Weekly Hours							27	11	2	8	0	6	0	21	426	324	750	30.00	
Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)					Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)								Semn (hr/w)



Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)							Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)								
UGI	3	1	DWRE211	Mathematics III	الرياضيات III	English	2				2			3	83	62	125	5.00	B	
		2	DWRE212	Fluid Mechanics I	ميكانيك الموائع I	English	2		2		2			3	93	57	150	6.00	C	
		3	DWRE213	Strength of Materials	مقاومة المواد	English	2	1			2			3	78	72	150	6.00	B	
		4	DWRE214	Surveying I	المساحة I	English	2		3		1			3	93	32	125	5.00	C	
		5	DWRE215	Computer Programming (MatLab)	برمجة الحاسوب (ماتلاب)	Arabic	2		2					3	83	37	100	4.00	B	
		6	DWRE216	Building Construction	انشاء المباني	Arabic	2		2					3	83	37	100	4.00	C	
		Total Weekly Hours							29	12	1	9	0	7	0	18	453	297	750	30.00
UGII	4	1	DWRE221	Engineering Analysis	تحليلات هندسية	English	2				2		3	83	62	125	5.00	B		
		2	DWRE222	Fluid Mechanics II	ميكانيك الموائع II	English	2		2		2		3	93	57	150	6.00	C	DWRE 212	
		3	DWRE223	Structures	مباني	English	2	1			2		3	78	72	150	6.00	B		
		4	DWRE224	Surveying II	المساحة II	English	2		3		1		3	93	32	125	5.00	C		
		5	DWRE225	Soil Physics	فيزياء التربة	Arabic	3		2		1		3	93	57	150	6.00	C		
		6	UOM201	Beath Crimes in Iraq	جرائم حزب البعث في العراق	Arabic	2						3	33	17	50	2.00	B		
		Total Weekly Hours							29	13	1	7	0	8	0	18	453	297	750	30.00



Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGII	5	1	DWRE311	Hydraulics	هيدروليك	English	2				3		3	78	47	125	5.00	C	
		2	DWRE312	Surface Water Hydrology	هيدرولوجي المياه السطحية	Arabic	2		2		1		3	78	47	125	5.00	C	
		3	DWRE313	Irrigation Principles and Practices	اسس الري و عملياته	Arabic	2				1	1	3	63	37	100	4.00	C	
		4	DWRE314	Concrete Design	تصميم خرسانة	English	3				1	2	3	93	82	175	7.00	S	
		5	DWRE315	Principles of Soil Mechanics	مبادئ ميكانيك التربة	English	2			3		2	3	108	67	175	7.00	C	
		6	DWRE316	Statistical Methods in Hydrology	الطرق الاحصائية في الهيدرولوجي	English	2						3	33	17	50	2.00	S	
		Total Weekly Hours						29	13	0	5	2	9	0	18	453	297	750	30.00
UGIII	6	1	DWRE321	Numerical Analysis	التحليلات العددية	English	3				2		3	78	72	150	6.00	C	
		2	DWRE322	Open Channels	القنوات المفتوحة	English	2				3		3	78	47	125	5.00	C	DWRE311
		3	DWRE323	Groundwater Hydrology	هيدرولوجي المياه الجوفية	Arabic	2		2		1		3	78	22	100	4.00	C	
		4	DWRE324	Drainage Engineering	هندسة الزل	Arabic	2		1		2		3	78	72	150	6.00	C	
		5	DWRE325	Soil Mechanics and Foundations	ميكانيك التربة والاسس	English	2		2		2		3	93	32	125	5.00	C	
		6	DWRE326	Consumptive Use and Water Duty	الاستهلاك المائي و المقننات المائية	Arabic	2				1	1	3	63	37	100	4.00	C	
		Total Weekly Hours						30	13	0	5	1	11	0	18	468	282	750	30.00



Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)								
UGIV	7	1	DWRE 411	Design of Hydraulic Structures I	تصميم المنشآت الهيدروليكية I	English	1				2	2		3	78	72	150	6.00	C	
		2	DWRE 412	Design of Gravity Irrigation Systems	تصميم منظومات الري السحي	English	2				1	2		3	78	72	150	6.00	C	
		3	DWRE 413	Design of Earth and Earth Rock Fill Dams	تصميم السدود الترابية والإملائية	English	2				1	2		3	78	72	150	6.00	C	
		4	DWRE 414	Engineering Management and Economics	الإدارة والاقتصاد الهندسي	English	2					2		3	63	62	125	5.00	C	
		5	DWRE 415	Design of Irrigation and Drainage Networks	تصميم شبكات الري والبزل	English	1				2	1		3	63	62	125	5.00	C	
		6	DWRE 416	Engineering Project I	المشروع الهندسي I	Arabic						2		3	33	17	50	2.00	C	
	Total Weekly Hours							25	8	0	0	6	11	0	18	393	357	750	30.0	
UGIV	8	1	DWRE 421	Design of Hydraulic Structures II	تصميم المنشآت الهيدروليكية II	English	1				2	2		3	78	72	150	6.00	C	
		2	DWRE 422	Design of Sprinkler and Drip Irrigation System	تصميم منظومات الري بالرش والتقطير	English	3				1	2		3	93	82	175	7.00	C	
		3	DWRE 423	Design of Gravity and Arch Dams	تصميم السدود الجاذبية والقوسية	English	2					3		3	78	72	150	6.00	C	
		4	DWRE 424	Estimations and Specifications	التخمين والمواصفات	Arabic	2		2			2		3	93	82	175	7.00	S	
		5	DWRE 425	Water Supply Engineering	هندسة تجهيز المياه	Arabic	2							3	33	17	50	2.00	S	
		6	DWRE 426	Engineering Project II	المشروع الهندسي II	Arabic						2		3	33	17	50	2.00	C	DWRE 416
	Total Weekly Hours							26	10	0	2	3	11	0	18	408	342	750	30.0	
Total							92	8	44	12	67	0	150	3495	2505	6000	240.0		Must be 240 EC	

Note: The student should complete 4 weeks of Summer Internships to fulfill the requirements of the Bachelor's degree

Structured SWL (hr/w) type	CL	Class Lecture	Lab	Laboratory	Pr	Practical Training	Tut	Tutorial	Lect	Online lecture	Semn	Seminar	Module type	B	Basic learning activities	SWL:	Student Workload
														C	Core learning activity	SSWL:	Structured SWL
														S <td>Support or related learning activity</td> <td>USSWL: <td>Unstructured SWL</td> </td>	Support or related learning activity	USSWL: <td>Unstructured SWL</td>	Unstructured SWL
														E <td>Elective learning activity</td> <td></td> <td></td>	Elective learning activity		

Note: Columns O, Q and R are programmed, protected and should not be edited



**University of Mosul / College of Engineering / Department of Dam Engineering and Water Resources
2025-2024 Course Catalog /Third Stages**

(Third Level (Provisions)/Fall semester)

	Type	Subject	Theoretical hours	Practical hours	Units	Pre-request	Code	Notes
University requirements	Compulsory	Engineering Analysis	2	1	2	Calculus IV	DWR340	
College requirements	Compulsory	Hydraulic	2	--	2	Fluid Mechanics2	DWR341	
	Compulsory	Surface Hydrology	2		2		DWR 342	
	Compulsory	Irrigation Principles and Practices	2	--	2	Water Resources and Land Reclamation	DWR 343	
	Compulsory	Theory of Structures1	2	1	2	Strength of Material2	DWR 344	
Department requirements	Compulsory	Concrete Design	2	--	2	Strength of Material2 and Construction Material Technology	DWR 345	
	Compulsory	Soil Mechanics1	1	2	2	Water Resources and Land Reclamation	DWR 346	
	Elective	Computer applications in Water Resources	1	2	2		DWR 347	Student choose one
	Elective	River Mechanics	2	--	2	Concrete Design	DWR 391	
	Elective	Statcal Methods in Hydrology	2	--	2	Calculus IV	DWR 395394	
Total hours			16	6	18			

Note :Summer Training is one of the requirements that the student has to apply during July or August.



University of Mosul / College of Engineering / Department of Dam Engineering and Water Resources
2025-2024 Course Catalog /Third Stages

(Third Level (Provisions)/Spring semester)

	Type	Subject	Theoretical hours	Practical hours	Units	Pre-request	Code	Notes
University requirements	Compulsory	English Language-Intermediate	2	--	2			
College requirements	Elective	Numerical Analysis	2	--	2	Calculus 1 and 2	ENGE320	Compulsory for depart.
Department requirements	Compulsory	Open Channels and Hydraulic Machines	2		2	Hydraulics	DWR 348	
	Compulsory	Groundwater Hydrology	2	--	2	Surface Hydrology	DWR 349	
	Compulsory	Drainage Engineering	2	--	2		DWR 350	
	Compulsory	Soil Mechanics2	1	2	2	Soil Mechanics1	DWR 351	
	Compulsory	Consumptive use and water duty	2	--	2	Irrigation Principles and Practices	DWR 352	
	Elective	Theory of Structures 2	2	--	2		DWR 392	
	Elective	Reinforces Concrete Design	2	--	2	Concrete Design	DWR 393	Student choose one
	Elective	Field Flow Measurements and Analysis	2	--	2		DWR 395	
	Elective	Computer Applications in Water Resources	2	--	2		DWR396	Student choose one
Total hours & units			17	2	18			



**University of Mosul / College of Engineering / Department of Dam Engineering and Water Resources
2025-2024 Course Catalog / Forth Stages**

(Fourth Level (Provisions)/Fall semester)

	Type	Subject	Theoretical hours	Practical hours	Units	Pre-request	Code	Notes
University requirements	Compulsory	English language-upper intermediate	2	--	2			
College requirements	Compulsory	Engineering Management	2	--	3		ENGC 425	
Department requirements	Compulsory	Design of Hydraulic Structure1	2	2	3	Open Channels and Hydraulic Machines	DWR 440	
	Compulsory	Design and Gravity Irrigation Systems	2	2	2	Irrigation Principles and Practices and Drainage Engineering	DWR 441	
	Compulsory	Design of Irrigation and Drainage Networks	2	--	2	Surface Hydrology	DWR 442	
	Compulsory	Design of Gravity and Arch Dams	2	--	2	Soil Mechanics 2	DWR 443	
	Compulsory	Foundation Engineering	2	--	2	All Department requirements	DWR 444	
	Compulsory	Graduation Project 1	2	--	2		DWR 445	
	Elective	Linear Algebra	2	--	2		DWR 490	Student choose one
	Elective	Operation Research	2	--	2		DWR 491	
Total hours			18	4	20			



**University of Mosul / College of Engineering / Department of Dam Engineering and Water Resources
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(Fourth Level (Provisions)/Spring semester)

	Type	Subject	Theoretical hours	Practical hours	Units	Pre-request	Code	Notes
University requirements	Compulsory	Engineering Economy	2	--	2		ENGC 426	
College requirements	Compulsory	Design of Hydraulic Structure2	2	2	3	Design of Hydraulic Structure 1	DWR 446	
Department requirements	Compulsory	Design of sprinkle and Drip Irrigation	2	2	3	Design and Gravity Irrigation Systems	DWR 447	
	Compulsory	Estimations and Specifications	1	2	2		DWR 448	
	Compulsory	Earth and Earth Roch Fill Dams	2	--	2	Design of Gravity and Arch Dams	DWR 449	
	Compulsory	Foundation Engineering of Hydraulic Structures	2	--	2	Foundation Engineering	DWR 450	
	Compulsory	Sediment Transport	2	--	2		DWR 451	
	Compulsory	Graduation Project 2	2	--	2	Graduation Project 1	DWR 452	
	Elective	Finite Elements	2	--	2		DWR 492	Student choose one
	Elective	Water Supply Engineering	2	--	2		DWR 493	
Total hours& units			17	6	20			



Post-Graduate Studies:

Code	Course	Credits	First Semester/Hours		Second Semester/ Hours	
			Theoretical	Practical	Theoretical	Practical
DWRE 701	Methodology	Fulfilled				2
DWRE 702	English Language	Fulfilled		2		
DWRE 703	Artificial Intelligence	2	1	2		
DWRE 704	Field Irrigation Management	3	2	2		
DWRE 705	Irrigation Systems	2			1	2
DWRE 706	Advanced Irrigation and Drainage	3			2	2
DWRE 707	Advanced Hydraulics	3			2	2
DWRE 708	Advanced Hydrology	3	2	2		
DWRE 709	Numerical Modeling in Water Resources	2			1	2
DWRE 710	Water Resources Systems Management and Statistical Applications	3			2	2
DWRE 711	Advanced Fluid Mechanics	3	2	2		
DWRE 712	Optimization	2	1	2		
Sum		26	8	12	8	12



Research Directions/Aspects Considered in Department of Dams & Water Resources Engineering

Research Directions:

Hydrology:

Research in hydrology encompasses the following areas:

Drought Analysis: Studying and analyzing drought phenomena, attempting to predict their severity and recurrence in Iraq.

Reservoir Operation: Optimizing the operation of water reservoirs to maximize benefits and developing simulation models for these projects.

Time Series Analysis: Analyzing time series data such as rainfall and river flow using artificial intelligence techniques in addition to traditional methods.

Water Supply Gap: Addressing the disparity between water supply and demand.

Flood Analysis: Studying flood characteristics, recurrence intervals, and potential damages.

Water Harvesting: Investigating suitable locations for constructing small dams to harvest water.

Hydropower Potential: Identifying potential sites for hydropower generation in river channels.



Hydraulics:

Research in hydraulics focuses on the following areas:

Open Channel Flow: Investigating the characteristics of flow in various open channels, including those with constant and compound cross-sections, and branched channels. Properties studied include energy loss, friction, surface roughness, velocity distribution, and water surface profiles.

Flow Over Structures: Studying flow characteristics over and through weirs and gates of different shapes and configurations.

Scour and Morphological Changes: Investigating scour and morphological changes in channels with movable beds, and scour around piers, the downstream face of weirs, and gates.

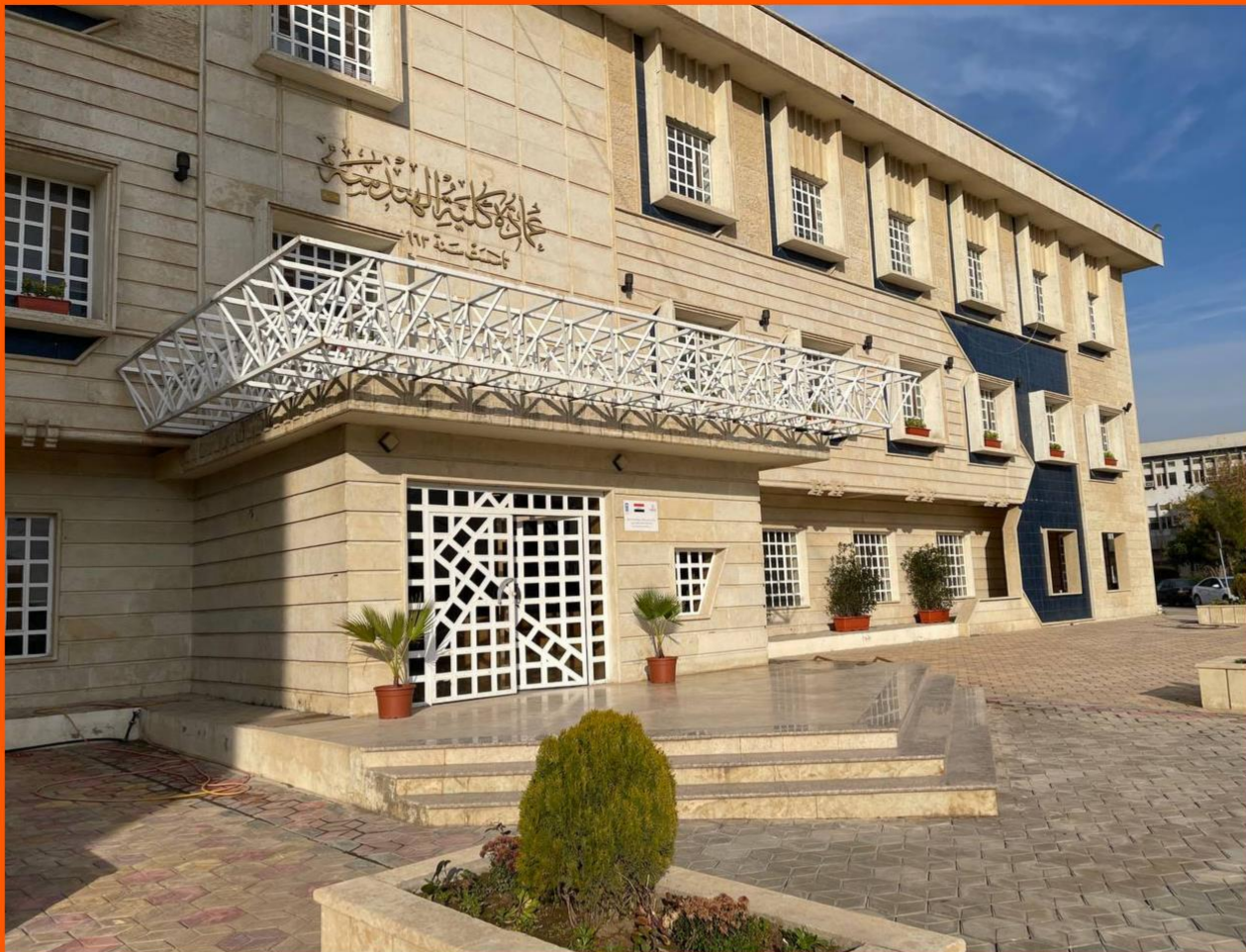
Irrigation and Drainage:

The primary goal in irrigation and drainage is to maximize the utilization of available water resources. This can be achieved through:

Sprinkler Irrigation: Achieving high irrigation efficiency through sprinkler systems, especially when combined with uniform water distribution. Increased uniformity directly improves water use efficiency and productivity.

Drip Irrigation: This method offers high irrigation efficiency due to low application rates, minimal surface runoff, and reduced deep percolation losses.

Deficit Irrigation: To maximize economic returns from limited water resources, especially in water-scarce regions, deficit irrigation is a suitable strategy to enhance water use efficiency.



**University of Mosul
College of Engineering**

**This guide has been prepared under the guidance of
the Dean of the College of Engineering
Professor Dr. Abdul Rahim Ibrahim Jassim**

**Under the supervision of the Head of the Dams and
Water Resources Engineering Department
Assistant Professor**

Dr. Omar Miqdad Abdel Ghani

**To serve as a reference for introducing the
Department of Dams and Water Resources
Engineering, its members, and the study programs
for undergraduate and graduate studies**

coordination

**Department of Media and Government
Communication at the College of Engineering**

2025 Edition