المناهج الدراسية للدراسات العليا في قسم الهندسة المدنية

1- Study of Doctorate

Doctor of Philosophy (Ph.D)	Structural Engineering

1st course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Theory of Plates and Shells II	نظرية الصفائح والقشريات II	3	-	-	3
Seismic Analysis and Design	تحليل و تصميم زلزالي	2	1	-	2
Composite Structures	منشات مركبة	3	-	-	3
Assessment and Rehabilitation of Reinforced Concrete Structures	تقييم وإعادة تأهيل المشأت الخرسانية المسلحة	2	1	-	2
Elective I	درس اختياري I	2	-	-	2
Technical English Language III	لغة انكليزية فنية III	1	1	-	-
Total		13	3	-	12

2nd course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Theory of Plasticity	نظرية اللدونة	3	-	-	3
Advanced Structural Steel Design	تصاميم فولاذ انشائي متقدم	2	1	-	2
Advanced Reinforced Concrete Design II	تصاميم خرسانة مسلحة متقدم II	2	1	-	2
Elastic Stability	الاستقرارية المرنة	3	-	-	3
Elective II	درس اختياري II	2	1	-	2
Technical English Language IV	لغة انكليزية فنية IV	1	1	-	-
Total		13	4	-	12

Electives

Subject in English
Optimization
Variational Analysis
Fluid Structure Interaction
Special Concrete and additives
Soil–Structure Interaction
Machine Foundations
Advanced Design Techniques for Special Structures

Units of study

Units of course	Unit
First term (1st.)	12
Second term (2nd.)	12
Thesis	36
Total units of study	60

Doctor of Philosophy (Ph.D)	Water resources Engineering

الترميز	اسم المادة باللغة العربية	اسم المادة باللغة العربية	عدد الساعات		عدد الوحدات
			نظري	تطبيقي	
CEWHS701	المنشات الهيدروليكية والكهرومائية	Hydraulic and Hydropower structures	3	-	3
CEWHS702	هيدروليكية القنوات المفتوحة II	Open Channel Hydraulics II	3	-	3
CEWHS703	طريقة العناصر المحددة	Finite Elements Method	3	1	3
CEWHS704	تكنولوجيا الخرسانة تحت الماء	Underwater Concrete Technology	3	-	3
CEWHS705	اختياري I	Elective I	2	-	2
CEWHS706	الكتابة التقنية الانكليزية I	Technical English Writing I	2	-	2
مجموع الساعات والوحدات			**16**	**2**	**16**
الفصل الدراسي الثاني					
الترميز	**اسم المادة باللغة العربية**	**اسم المادة باللغة العربية**	**عدد الساعات**		**عدد الوحدات**
			نظري	**تطبيقي**	
CEWHS707	تحليل و تصميم المنشات البحرية	Analysis and Design of Offshore Structures	3	-	3
CEWHS708	هندسة السدود والخزانات	Dams and Reservoirs Engineering	3	-	3
CEWHS709	ديناميك الموائع الحسابي	Computational Fluid Dynamics	3	-	3
CEWHS710	الهيدرولوجيا العشوائية	Stochastic Hydrology	3	-	3
CEWHS711	الكتابة التقنية الانكليزية II	Technical English Writing II	2	-	2
CEWHS712	اختياري II	Elective II	2	-	2
مجموع الساعات والوحدات			**16**	**1**	**16**
اطروحة (سنتان)		**Thesis (2 years)**	**-**	**-**	**28**
المجموع الكلي		**60 وحدة دراسية**			

عاشرا: الدروس الاختيارية المقترحة (Elective I & Elective II):

No.	Subject
1	Hydrologic Applications of Remote Sensing
2	Water Resource Planning and Management
3	Groundwater Flow and Pollution Modelling
4	Water Resources Engineering Materials
5	Recent Advances in Water Resources Construction Materials
6	Economics Aspects of Water Resources Development
7	Engineering Properties of Rocks and Rock Masses
8	Site Investigations and Ground Improvement
9	Advanced Structural Analysis
10	Earthquake Analysis and Design
11	Design of Steel Water Resources Structures
12	Advanced Hydraulic Structures
13	Shallow and Deep Foundations
14	Soil Dynamics
15	Environmental Impact Assessment and Management
16	Fluid Structure Interaction
17	Urban Surface and Subsurface Drainage

2. Study of Master of Science

1st course

Master of Science (M.Sc)	Structural Engineering

1st course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Advance Structural Analysis	تحليل انشائي متقدم	3	-	-	3
Theory of Elasticity	نظرية المرونة	3	-	-	3
Prestressed Concrete	خرسانة مسبقة الجهد	2	1	-	2
Advanced Reinforced Concrete Design I	تصاميم خرسانة مسلحة متقدم I	3	-	-	3
Elective I	درس اختياري I	2	1	-	2
Technical English Language I	لغة انكليزية فنية I	1	1	-	-
Total		14	3	-	13

2nd course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Finite Element Method	طريقة العناصر المحددة	3	-	-	3
Theory of Plates and Shells I	نظرية الصفائح والقشرياتI	3	-	-	3
Structural Dynamics	ديناميك المنشأت	3	-	-	3
Elective II	درس اختياريII	2	1	-	2
Technical English Language II	لغة انكليزية فنيةII	1	1	-	-
Total		12	2	-	11

Electives

Subject in English
Advanced Concrete Technology
Advanced Numerical Methods II
Plastic Analysis and Design
Tall Buildings
Advanced Engineering Mathematics

Units of study

Units of course	Unit
First term (1st.)	13
Second term (2nd.)	11
Thesis	10
Total units of study	34

Master of Science (M.Sc) | **Construction Materials Engineering**

1st course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Advanced Concrete Technology /I	تكنولوجيا خرسانة متقدم / I	2	-	2	3
Quality control of Construction Materials	السيطرة النوعية على المواد الانشائية	3	-	-	3
Ceramic Technology	تكنولوجيا السيراميك	2	-	-	2
Behavior of structural concrete	سلوك الخرسانة الانشائية	2	-	-	2
Elective I	درس اختياري I	2	-	-	2
Technical English Language I	لغة انكليزية فنية I	1	1	-	-
Total		12	1	2	12

2nd course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Advanced Concrete Technology / II	تكنولوجيا خرسانة متقدم / II	2	-	2	3
Composite Materials and Ferrocement	مواد تركيبية وفيروسمنت	2	-	-	2
Special Concrete	خرسانة خاصة	2	-	-	2
Concrete Durability	ديمومة الخرسانة	3	-	-	3
Elective II	درس اختياري II	2	-	-	2
Technical English Language II	لغة انكليزية فنية II	1	1	-	-
Total		12	1	1	12

Electives

Subject in English
Corrosion of concrete structures
Protection and repair of damaged concrete.
Service Life modelling of concrete structures
Advanced engineering statistics
Advanced Numerical Analysis

Units of study

Units of course	Unit
First term (1st.)	12
Second term (2nd.)	12
Thesis	10
Total units of study	34

Master of Science (M.Sc)	**Water Resources Engineering**

1st course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Groundwater Hydraulics	هيدروليكية المياه الجوفية	2	1	-	2
Optimization Techniques	تقنيات الامثلية	3	-	-	3
Open Channel Hydraulics I	هيدروليكية القنوات المفتوحة I	3	-	-	3
Statistics in Water Resources Engineering	الاحصاء في هندسة الموارد المائية	2	1	-	2
Elective I	درس اختياري I	2	-	-	2
Technical English Language I	لغة انكليزية فنية I	1	1	-	-
Total		13	3	-	12

2nd course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Design of Hydraulic Structures	تصميم المنشئات الهيدروليكية	3	-	-	3
Rivers Mechanics and Sediment Transport	ميكانيك الانهار وانتقال الرسوبيات	2	1	-	2
Modeling in Water Resources Engineering	النمذجة في هندسة الموارد المائية	2	1	-	2
Advanced Surface Water Hydrology	هيدرولوجيا المياه السطحية المتقدمة	3	-	-	3
Fundamentals of Finite Element	درس اختياري II	2	-	-	2
Technical English Language II	لغة انكليزية فنية II	1	1	-	-
Total		13	3	-	12

Electives

Subject in English
Urban Drainage
Geographical Information System (GIS) in Water Resources
Finite Element Method
Water Resources Planning and Management
Hydrological Modeling
Environmental Management of Water Resources
Dams Engineering
Water Power Engineering
Nero-Fuzzy Applications in Water Resources Engineering
Advanced Mathematics.
Advanced Fluid Mechanics
Remote Sensing in Water Resources.

Units of study

Units of course	Unit
First term (1st.)	12
Second term (2nd.)	12
Thesis	10
Total units of study	34

Master of Science (M.Sc)	Transportation Engineering

1st course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Advanced Traffic Engineering	هندسة مرور متقدم	3	-	-	3
Advanced Pavement Design	تصميم تبليط متقدم	3	-	-	3
Railways Engineering	هندسة السكك الحديد	2	-	-	2
Airport Engineering	هندسة المطارات	2		-	2
Elective I	درس اختياري I	2	-	-	2
Technical English Language I	لغة انكليزية فنية I	1	1		-
Total		12	1	-	12

2nd course

Subject in English	Subject in Arabic	Hours			Unit
		L	T	P	
Advanced Geometric Design	تصميم هندسي متقدم	3	-	-	3
Highway Materials Technology	تقنية مواد التبليط	2	2	-	3
Roadways Maintenance and Management	ادارة وصيانة الطرق	2	-	-	2
Transportation Planning	تخطيط النقل	2	-	-	2
Elective II	درس اختياري II	2	-	-	2
Technical English Language II	لغة انكليزية فنية II	1	1	-	-
Total		11	3	-	12

Electives

Subject in English
Bridge Design.
Highway Drainage
Sustainable Transport Operation.
Highway Safety.
Advanced Numerical Analysis.
Advanced Engineering Statistics.

Units of study

Units of course	Unit
First term (1st.)	12
Second term (2nd.)	12
Thesis	10
Total units of study	34

3.Study of Higher Diploma of Engineering Science

H.D. Courses: Structural Engineering

	EN.CV.HD.ACT1	Advanced Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.CSD1	Computer Structural Design	2	understanding, applying and analyzing
	EN.CV.HD.HS1	Hydraulic Structures I	2	understanding, applying and analyzing
	EN.CV.HD.ASE1	Advanced Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.GE1	Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.RE1	Roadways Engineering	2	understanding, applying and analyzing
	Total		12	
Second Semester (Dept. Requirements)	Code	Subject	units	Bloom's Taxonomy
	EN.CV.HD.BSD2	Bridges Structural design	2	understanding, applying and analyzing
	EN.CV.HD.PSCP2	Prestresssed Concrete Principles	2	understanding, applying and analyzing
	EN.CV.HD.SCSD2	Special Concrete Structure Design	2	understanding, applying and analyzing
	EN.CV.HD.STCT2	Selected Topics in Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.NASE2	Numerical Applications in Structural Engineering	2	understanding, applying and analyzing
	EN.CV.HD.SAUMP2	Structural Analysis using Mathematical Procedures	2	understanding, applying and analyzing
	Total		12	

Units of 1st and 2nd Term = 24
Units of 3rd Term (Thesis) = 4
Total Unit = 28

H.D. Courses: Sanitary Engineering

	Code	Subject	units	Bloom's Taxonomy
First Semester (General)	EN.CV.HD.ACT1	Advanced Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.CSD1	Computer Structural Design	2	understanding, applying and analyzing
	EN.CV.HD.HS1	Hydraulic Structures I	2	understanding, applying and analyzing
	EN.CV.HD.ASE1	Advanced Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.GE1	Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.RE1	Roadways Engineering	2	understanding, applying and analyzing
	Total		12	
	Code	Subject	units	Bloom's Taxonomy
Second Semester (Dept.	EN.CV.HD.ND2	Networks Design	2	understanding, applying and analyzing
	EN.CV.HD.TPD2	Treatment Plants Design	2	understanding, applying and analyzing
	EN.CV.HD.WTPD2	Water Treatment Plants Design	2	understanding, applying and analyzing
	EN.CV.HD.P2	Plumbing	2	understanding, applying and analyzing
	EN.CV.HD.NASE2	Numerical Applications in Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.TPSD2	Treatment Plants Structural Design	2	understanding, applying and analyzing
	Total		12	

Units of 1st and 2nd Term = 24
Units of 3rd Term (Thesis) = 4
Total Unit = 28

H.D. Courses: Soil and Foundations Engineering

	Code	Subject	units	Bloom's Taxonomy
First Semester (General)	EN.CV.HD.ACT1	Advanced Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.CSD1	Computer Structural Design	2	understanding, applying and analyzing
	EN.CV.HD.HS1	Hydraulic Structures I	2	understanding, applying and analyzing
	EN.CV.HD.ASE1	Advanced Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.GE1	Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.RE1	Roadways Engineering	2	understanding, applying and analyzing
	Total		12	
	Code	Subject	units	Bloom's Taxonomy
Second Semester (Dept. Requirements)	EN.CV.HD.ASM2	Advanced Soil Mechanics	2	understanding, applying and analyzing
	EN.CV.HD.AFE2	Advanced Foundation Engineering	2	understanding, applying and analyzing
	EN.CV.HD.SIS2	Soil Improvement and Stabilization	2	understanding, applying and analyzing
	EN.CV.HD.GS2	Groundwater and Seepage	2	understanding, applying and analyzing
	EN.CV.HD.NAGE2	Numerical Applications in Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.SILT2	Site Investigations and Laboratory Tests	2	understanding, applying and analyzing
	Total		12	

Units of 1st and 2nd Term = 24
Units of 3rd Term (Thesis) = 4
Total Unit = 28

H.D. Courses: Hydraulic Structures Engineering

	Code	Subject	units	Bloom's Taxonomy
First Semester (General)	EN.CV.HD.ACT1	Advanced Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.CSD1	Computer Structural Design	2	understanding, applying and analyzing
	EN.CV.HD.HS1	Hydraulic Structures I	2	understanding, applying and analyzing
	EN.CV.HD.ASE1	Advanced Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.GE1	Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.RE1	Roadways Engineering	2	understanding, applying and analyzing
	Total		12	
	Code	Subject	units	Bloom's Taxonomy
Second Semester (Dept.	EN.CV.HD.DR2	Dams and Reservoirs	2	understanding, applying and analyzing
	EN.CV.HD.SDHS2	Structural Design of Hydraulic Structures	2	understanding, applying and analyzing
	EN.CV.HD.OCP2	Open Channels and Pipes	2	understanding, applying and analyzing
	EN.CV.HD.HG2	Hydrogeology	2	understanding, applying and analyzing
	EN.CV.HD.NA2	Numerical Applications	2	understanding, applying and analyzing
	EN.CV.HD.WCS2	Waterways Crossing Structures	2	understanding, applying and analyzing
	Total		12	

Units of 1st and 2nd Term = 24
Units of 3rd Term (Thesis) = 4
Total Unit = 28

H.D. Courses: Construction Materials Engineering

	Code	Subject	units	Bloom's Taxonomy
First Semester (General)	EN.CV.HD.ACT1	Advanced Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.CSD1	Computer Structural Design	2	understanding, applying and analyzing
	EN.CV.HD.HS1	Hydraulic Structures I	2	understanding, applying and analyzing
	EN.CV.HD.ASE1	Advanced Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.GE1	Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.RE1	Roadways Engineering	2	understanding, applying and analyzing
	Total		12	
	Code	Subject	units	Bloom's Taxonomy
Second Semester (Dept.	EN.CV.HD.CM2	Composite Materials	2	understanding, applying and analyzing
	EN.CV.HD.SCA2	Special Concrete and Additives	2	understanding, applying and analyzing
	EN.CV.HD.DBR2	Damaged Buildings Rehabilitation	2	understanding, applying and analyzing
	EN.CV.HD.DNDT2	Destructive and Nondestructive Tests	2	understanding, applying and analyzing
	EN.CV.HD.CDI2	Concrete Durability I	2	understanding, applying and analyzing
	EN.CV.HD.SA2	Statistical Applications	2	understanding, applying and analyzing
	Total		12	

Units of 1st and 2nd Term = 24
Units of 3rd Term (Thesis) = 4
Total Unit = 28

H.D. Courses: Roadways Engineering

	Code	Subject	units	Bloom's Taxonomy
First Semester (General)	EN.CV.HD.ACT1	Advanced Concrete Technology	2	understanding, applying and analyzing
	EN.CV.HD.CSD1	Computer Structural Design	2	understanding, applying and analyzing
	EN.CV.HD.HS1	Hydraulic Structures I	2	understanding, applying and analyzing
	EN.CV.HD.ASE1	Advanced Sanitary Engineering	2	understanding, applying and analyzing
	EN.CV.HD.GE1	Geotechnical Engineering	2	understanding, applying and analyzing
	EN.CV.HD.RE1	Roadways Engineering	2	understanding, applying and analyzing
	Total		12	
	Code	Subject	units	Bloom's Taxonomy
Second Semester (Dept.	EN.CV.HD.APDI2	Advanced Pavement Design I	2	understanding, applying and analyzing
	EN.CV.HD.RPI2	Roadways Planning I	2	understanding, applying and analyzing
	EN.CV.HD.API2	Airports Engineering I	2	understanding, applying and analyzing
	EN.CV.HD.RDS2	Roadways Drainage Systems	2	understanding, applying and analyzing
	EN.CV.HD.ATEI2	Advanced Traffic Engineering I	2	understanding, applying and analyzing
	EN.CV.HD.RSA2	Statistical Applications	2	understanding, applying and analyzing
	Total		12	

Units of 1st and 2nd Term = 24
Units of 3rd Term (Thesis) = 4
Total Unit = 28