

Module (Course Syllabus) Catalogue 2020-2021

College/ Institute	Erbil Technical Engineering College	
Department	Civil Engineering Department	
Module Name	Foundation Structural Design	
Module Code	CFS805	
Degree	Technical Diploma <input type="checkbox"/>	Bachelor <input checked="" type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> PhD <input type="checkbox"/>
Semester	Eighth Semester	
Qualification	BSc Civil Engineering Techniques/ Erbil	
Scientific Title	Professor	
ECTS (Credits)	4	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours		
Weekly hours (Theory)	(3)hr Class	(108)Total hrs Workload
Weekly hours (Practical)	()hr Class	()Total hrs Workload
Number of Weeks		
Lecturer (Theory)	Prof. Dr. Mereen Hassan Fahmi Rasheed	
E-Mail & Mobile NO.	mereen.akrawi@epu.edu.iq (07504615781)	
Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites		

Course Book

Course Description	This course covers structural analysis and design of all types of foundations				
Course objectives	This course aims at providing students the thorough knowledge in the structural analysis and design of different types of foundations.				
Student's obligation	<p>The students are required to:</p> <ul style="list-style-type: none"> -Attend all the lectures and participate in the classwork and assignments. -Participate in the exam. 				
Required Learning Materials	Different pedagogical methods are used in this course; for example, project, report, and homework, easy. Student will receive the required handouts such as the references.				
Evaluation	Task	Weight (Marks)	Due Week	Relevant Learning Outcome	
	Paper Review				
	Assignments	Homework	10%		
		Class Activity	2%		
		Report	8%		
		Seminar	8%		
		Essay			
		Project			
	Quiz		8%		
	Lab.				
	Midterm Exam		24%		
	Final Exam		40%		
Total		100%			

Specific learning outcome:	<p>On successful completion of this course, each student is able to:</p> <ol style="list-style-type: none"> a) Design, and analysis of wall footings b) Design, and analysis of isolated footings c) Design, and analysis of combined footings d) Design, and analysis of raft footings e) Design, and analysis of retaining walls f) Design, and analysis of pile caps 	
Course References:	<ul style="list-style-type: none"> • “Design of Concrete Structures”, 16th Edition by Darwin & Dolan. • ACI Code 2019. • “Reinforced Concrete Design” by Wang & Salmon. • “Concrete Structures” by Mehdi S. & Robert D. • “Structural Concrete” by Hassoun M.N. & Al-Maanaseer A. • “Reinforced Concrete” by G. Nawy. • “Design of reinforced concrete” by McCormac & Nelson. • “Reinforced Concrete” by Weight & MacGregor. • “ACI Design Handbook” • “ACI Committee 318” • “Principle of Foundation Design” by B.M. Das. • “Foundation analysis and design” by J.E. Bowels. • “Foundation Design” by Allan H. • “Deep Foubdation” by UFC. • “The Design of Piled Foundations” by Thomas W. • “Design of Pile Foundations in Liquefiable Soils” by Gopal M. and Others. • “Design of Shallow Foundations” by S.E. French. • “Shallow Foundations” by B.M. Das. • “Structural Foundation Designer’s Manual” by W.G. Curtin & Others. • “Design applications of Raft foundations” by A. J. Hemsley. 	
Course topics (Theory)	Week	Learning Outcome
• Introduction to reinforced concrete footings	1	a)
• Design of Wall footing.	1	a)
• Design of Square Single Footing.	2	b)
• Design of Rectangular single footing.	3	b)
• Design of Combined footing.	4	c)
• Design of Trapezoidal combined footing.	5	c)

• Design of Strap footing.	6	c)
• Design of Retaining walls.	7	e)
• Design of Cantilever retaining wall.	8, 9	e)
• Design of Raft foundation.	10, 11	d)
• Design of pile foundation & Pile cap.	12	f)
Practical Topics	Week	Learning Outcome
N/A		

Questions Example Design

Q1:

A continuous strip footing is to be located concentrically under a 12 in. wall that delivers service loads $D=25,000$ lb/ft and $L=15,000$ lb/ft to the top of the footing. The bottom of the footing is 4 ft below the final ground surface. The soil has a density of 120 pcf and allowable bearing capacity of 8000 psf. Material strengths are $f_c'=3000$ psi and $f_y=60,000$ psi. Find (a) the required width of the footing, (b) the required effective and total depths, based on shear, and (c) the required flexural steel area.

Q2:

An interior column for a tall concrete structure carries total service loads $D=500$ kips and $L=514$ kips. The column is 22×22 in. in cross section and is reinforced with 12 No. 11 (No. 36) bars centered 3 in. from the column faces (equal number of bars each face). For the column, $f_c'=4000$ psi and $f_y=60,000$ psi. The column is supported on a square footing, with the bottom of the footing 6 ft below grade. Design the footing, determining all concrete dimensions and amount and placement of all reinforcement, including length and placement of dowel steel. No shear reinforcement is permitted. The allowable soil bearing pressure is 8000 psf. Material strengths for the footing are $f_c'=3000$ psi and $f_y=60,000$ psi.

Extra notes: * ECTS Calculation

Erbil Technology College

Program: Bachelor (240 ECTS)

Department name: Civil Engineering

Weeks/Semester: 15-20 weeks

(Min. 12 weeks active lecturing (Including Mid Term exams with no stopping of lectures) + 3 weeks Final & Re-sit Exams (including one week break inbetween))

Lecturer Name: Prof. Dr. Mereen Hassan Fahmi Rasheed **1.0 ECTS = 27** working hours

Module Name: Concrete Foundation Structures **X Y Z**
 Module Code: CFS805 **3 0 0**

ECTS Workload Calculation Form

Activity	S	Description	Activity Type	No.	T.F. Range		Time Factor	Workload	
					Min	Max			
Course	1	Theory	In class	f	12		3	36	
	2		Online	f	0		3	0	
	3	Preparation: (1-2)* X		h	12	3	6	3	36
	4	Practical		f	12			0	0
	5	Preparation: (1-1.5)* Y		h	0	0	0	2.5	0
	6	Tutorial		f	12	1	1	0	0
	7	Preparation (0.5-1.5) * Z		h	0	0	0	1.5	0
Site Visits and Lab Experiments	8	Scientific/Field Trips		f	0	2	6	4	0
	9	Practical/Lab Reports		h	0	1	2	1.5	0
Assignment	10	Homework		h	2	1	4	2	4
	11	Report		h	1	1	4	2	2
	12	Seminar		h	1	4	15	8	8
	13	Paper		h		4	15		0
	14	Essay		h		1	6		0
15	Project/Poster			h					
Assessment	16	Quiz		h	2	1	2	1.5	3
	17	Mid Term	Theory	f	1			1	1
	18		Preparation: (1.5-3)*X	h	1	4.5	9	7	7
	19		Practical	f	0			1	0
	20	Preparation: (1-2)*Y		h	0	0	0	3	0
	21	Final	Theory	f	1			2	2
	22		Preparation: (3-5)*X	h	1	9	15	10	10
	23		Practical	f	0			1	0
24	Preparation: (2-4)*Y		h	0	0	0	5	0	
Face to face hours (f)/12 week		3.25		Face to face hours (f)				39	
Home hours (h)/15 week		4.67		Home hours (h)				70	
Total hours/15 week		7.27		Total hours				109	
ECTS (Total hours/ 27)								4.037	

External Evaluator

I have reviewed the course catalogue which are prepared will covered the required subjected related to the course.

Assit. Prof. Bahman O. Taha