Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	Erbil Technical Engineering College
Department	Civil Engineering Department
Module Name	Concrete Foundation Structures
Module Code	CFS805
Degree	Technical Diploma ☐ Bachler ☑ High Diploma ☐ Master ☐ PhD ☐
Semester	Eighth Semester
Qualification	BSc Civil Engineering Techniques/ Erbil
Scientific Title	Professor
ECTS (Credits)	4
Module type	Prerequisite ☐ Core ☑ Assist. ☐
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** **Mr. Deedar Hussein**
E-Mail & Mobile NO.	mereen.akrawi@epu.edu.iq (07504615781) deedar.hussein@eou.edu.iq (07504169607)
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	The students are required to: -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%		

	On successful completion of this course, each student is able to: 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
Specific learning outcome:	
Course References:	• "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 Foundation" 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)

Practical Topics	Week	Learning Outcome
• 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 fc '=3000 psi and fy=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, fc '=4000 psi and fy=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 fc '=3000 psi and fy=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 Min	T.F. Range Max	Time Factor	Workload
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 Visists 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**

Directorate of Quality Assurance and Accreditation   بەڕێوەبەرایەتی دڵنیایی جۆری و متمانەبەخشین

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