

Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	College of Erbil Technical Engineering	
Department	Civil Engineering	
Module Name	Engineering Analysis	
Module Code	ENA504	
Degree	Technical Diploma <input type="checkbox"/> Bachler <input checked="" type="checkbox"/> High Diploma <input type="checkbox"/> Master <input type="checkbox"/> PhD <input type="checkbox"/>	
Semester	Fifth Semester	
Qualification	BSc Civil Engineering Techniques/ Erbil	
Scientific Title	Assistant Lecturer	
ECTS (Credits)	6	
Module type	Prerequisite <input type="checkbox"/> Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>	
Weekly hours		
Weekly hours (Theory)	(4)hr Class	(162)Total hrs Workload
Weekly hours (Practical)	()hr Class	()Total hrs Workload
Number of Weeks	12	
Lecturer (Theory)	Zina A. Abduljaleel	
E-Mail & Mobile NO.	Email: Zina.abduljaleel@epu.edu.iq	
Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites		

Course Book

Course Description	Mathematics is called the language of science. It is a very important material, especially for engineers and physics. Studying advanced mathematics help engineers find solutions to complex mathematical models that cannot be solved explicitly, where approximate solutions are quite sufficient for practical purposes.
Course objectives	Making the students familiar with different mathematical methods used to model engineering applications. In addition, implementing and solving mathematical models for engineering problems.
Student's obligation	The students are required to: -Attend all the lectures and participate in the classwork and assignments. -Participate in the exam.
Specific learning outcome:	On successful completion of this course, each student is able to: a) Solve 1 st order DEs b) Solve 2 nd order DEs c) Create/ implement mathematical models for engineering problems d) Apply Fourier Series for solving engineering problems e) Apply Laplace Transform for solving engineering problems f) Apply matrix operations for solving linear system equations g) Use Partial DEs
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			
		Essay			
		Project	8%		
	Quiz		8%		
	Lab.				
	Midterm Exam		24%		
	Final Exam		40%		
	Total		100%		
Course References:	1- Erwin Kreyszic, "Advanced Engineering Mathematics", 9 th edition, John Wiley & Sons, 2006. 2- Glyn James, "Advanced Modern Engineering Mathematics", 4 th Edition, Prentice Hall Edition, 2011. 3- PETER V. O'NEIL, "Advanced Engineering Mathematics", 7 th Edition, Cengage Learning, 2012.				
Course topics (Theory)			Week	Learning Outcome	
Introduction: differential equations (DEs) 1st order DEs: Separation of variables 1st order DEs: Reduction to Separable			1	a)	
1st Order DEs: Exact DEs 1st Order DEs: Linear DEs			2	a)	
2 nd Order DEs: Homogeneous Equations			3	b)	
2 nd Order DEs: Non-Homogeneous			4	b)	
Applications of 1 st and 2 nd Order DEs			5	c)	
Laplace Transform			6	e)	
Inverse Laplace Transform			7	e)	
Solution of differential equations by Laplace transform			8	e)	

Partial Differential Equations – Part1	9	f)
Partial Differential Equations – Part2	10	f)
Introduction to Fourier series of periodic functions	11	d)
Fourier series of any range and half-range series	12	d)
Practical Topics	Week	Learning Outcome
N/A		

Questions Example Design

Q1: Solve $y' = 1 + y^2$

Solu:

$$dy = (1 + y^2) dx$$

$$\int \frac{dy}{1+y^2} = \int dx$$

$$\tan^{-1} y = x + c$$

$$y = \tan(x+c)$$

Q2: Use the definition of the Laplace transform to calculate the transforms of $f(t)$ when $f(t)$ is given by:

a) t^2 b) $3+t$ c) $t e^{-t}$

Extra notes: * ECTS Calculation

Erbil Technology College

Program: Bachelor (240 ECTS)

Department name:

Civil Engineering Dept.

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: Zina A. Abduljaleel

1.0 **27** working
ECTS = hours

Module Name: Engineering Analysis

X Y Z

Module Code: ENA504

4 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			4	48
	2		Online	f	0			4	0
	3	Preparation: (1-2)* X		h	12	4	8	6	72
	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	4	4
	12	Seminar		h		2	10		0
	13	Paper		h		4	15		0
	14	Essay		h		1	6		0
15	Project/Poster		h	1	4	15	9	9	
Assessment	16	Quiz		h	2	1	2	1	2
	17	Mid Term	Theory	f	1			1	1
	18		Preparation: (1.5-3)*X	h	1	6	12	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	12	20	13	13
	23		Practical	f	0			1	0
24	Preparation: (2-4)*Y		h	0	0	0	5	0	
Face to face hours (f)/12 week		4.25		Face to face hours (f)		51			
Home hours (h)/15 week		7.40		Home hours (h)		111			
Total hours/15 week		10.80		Total hours		162			
ECTS (Total hours/ 27)						6.000			

External Evaluator

