Kurdistan Region Government
Ministry of Higher Education
and Scientific Research
Erbil Polytechnic University

زانکۆی پۆلیتەکنیکی هەولێر
ERBIL POLYTECHNIC UNIVERSITY
EPU
1996

Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	College of Erbil Technical Engineering
Department	Civil Engineering
Module Name	Engineering Analysis
Module Code	ENA504
Degree	Technical Diploma ☐ Bachler ☑ High Diploma ☐ Master ☐ PhD ☐
Semester	Fifth Semester
Qualification	BSc Civil Engineering Techniques/ Erbil
Scientific Title	Assistant Lecturer
ECTS (Credits)	6
Module type	Prerequisite ☐ Core ☑ Assist. ☐
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 Mobile: +9647504240246
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** 1st order DEs b) **Solve** 2nd 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.

	Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Evaluation		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", 9th edition, John Wiley & Sons, 2006. 2- Glyn James, "Advanced Modern Engineering Mathematics", 4th Edition, Prentice Hall Edition, 2011. 3- PETER V. O'NEIL, "Advanced Engineering Mathematics", 7th 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)
2nd Order DEs: Homogeneous Equations	3	b)
2nd Order DEs: Non-Homogeneous	4	b)
Applications of 1st and 2nd Order DEs	4	c)
Introduction to Fourier series of periodic functions	5	d)
Fourier series of any range and half-range series	6	d)
Applications of Fourier series	7	d)

Laplace Transform	8	e)
Solution of differential equations by Laplace transform	9	e)
Partial Differential Equations	10	f)
Introduction to matrices and determinants	11	f)
Solving simultaneous equations using matrices	12	g)
Practical Topics	**Week**	**Learning Outcome**
N/A		

Questions Example Design

Q1: Solve y` = 1+ y²

Solu:

dy = (1+y²) 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 ECTS =**	**27**	working 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 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	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**

Directorate of Quality Assurance and Accreditation بەڕێوەبەرایەتی دڵنیایی جۆری و متمانەبەخشین

External Evaluator