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2. Course Code: CE 3201

3. Semester / Year: 2st / 2023-2024

4. Description Preparation Date: 13/3/2024

5. Available Attendance Forms: Attending lectures in the department's classrooms.

6. Number of Credit Hours (Total) / Number of Units (Total): 30Hours/ 2 Units

7. Course administrator's name (mention all, if more than one name) Name: Assist. Prof. Yousra Abd Mohammed Email: Yousra.a.mohammed@uotechnology.edu.iq

8. Course Objectives	
Course Objectives	<ul> <li>To study the principles of Numerical Analysis and its applications.</li> <li>Teaching students how to use programming to solve complicated problems.</li> <li>Gain knowledge about how to solve Ordinary Differential Equations, interpolation, and curve fitting problems by attrition.</li> </ul>

#### 9. Teaching and Learning Strategies

Strate Theoretical lectures using PPT & PDF, and Video lectures.

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple tutorial involving some sampling activities that are interesting to the students.

#### 10. Course Structure

V	Hours	Required	Unit or subject	Learning	Evaluation method
е		Learning	name	method	
		Outcomes			

1

е					
k					
1	2 theoretical	A ,B, and C	Methods for 1st order	ppt. pdf. &	Quiz, Discussion & Exam
	2 metredied		Ordinary Differential	Video lectures	
2	2 theoretical	A B and C	Improved Euler method,	nat adf &	Quiz, Discussion & Exam
		11,D, and C	Backward Euler method	ppt, put, &	
2	2 theoretical	A B and C	Heun's method: trapezoidal	Video lectures	Ouiz Discussion & Exam
J	2 moorotiour	A,D, allu C	method,	ppt, pdf, &	
4	2 theoretical		Runge Kutta method	Video lectures	Quiz Discussion & Exam
4	2 theoretical	A,B, and C	Runge-Rutta memou	ppt, pdf, &	Quiz, Discussion & Exam
				Video lectures	
5	2 theoretical	A ,B, and C	Adams-Bashforth methods, Adams-Moulton methods.	ppt, pdf, &	Quiz, Discussion & Exam
				Video lectures	
6	2 theoretical	A ,B, and C	Linear & Quadratic	ppt, pdf, &	Quiz, Discussion & Exam
			interpolation	Video lectures	
7	2 theoretical	A,B, and C	N- interpolation degree	ppt. pdf. &	Quiz, Discussion & Exam
				Video lectures	
8	2 theoretical	A.B. and C	interpolation, Interpolation	ppt pdf &	Quiz, Discussion & Exam
			by Newton polynomial	Vidaa laaturaa	
q	2 theoretical	A B and C	approximation by	video lectures	Ouiz . Discussion & Exam
		, D, and C	Chebyshev polynomial	ppt, pdf, &	
1	2 theoretical	A D and C	interpolation by Cubic	Video lectures	Quiz Discussion & Exam
	2 metredi	A,B, and C	spline	ppt, pdf, &	
U			Hamaita internalatina	Video lectures	
1	2 theoretical	A ,B, and C	polynomial.	ppt, pdf, &	Quiz, Discussion & Exam
1			1 2	Video lectures	
1	2 theoretical	A,B, and C	Straight line fit (a	ppt. pdf. &	Quiz, Discussion & Exam
2			polynomial function of first degree)	Video lectures	
1	2 theoretical	A.B. and C	Polynomial curve fit(a	ppt pdf &	Quiz, Discussion & Exam
3			polynomial function of	Video lestures	
1	2 theoretical	A B and C	Exponential curve fit	video lectures	Ouiz . Discussion & Exam
1 1		A,D, anu C	and other functions.	ppt, pdf, &	
т 1	2 theoretical		Finite differences	Video lectures	Quiz Discussion & Exam
	2 theoretical	A,B, and C		ppt, pdf, &	Quiz, Discussion & Exam
5				Video lectures	
	11. Course E	valuation			
T	erm Tests	Quizzes	Final Exam		
A	s(30%)	As(10%)	As(60%)		
	12. Learning	and Teaching	g Resources		
R	equired textbool	ks (curricular l	books	-	
ar	iy)				

Main references (sources)	<ul> <li>Applied Numerical methods using MATLAB, W. Y. Yang, a John Wiley and Sons.</li> <li>Advance Engineering Mathematics. E. Kreyszing, 9<sup>th</sup> Edition, 2006.</li> </ul>
Recommended books and references	Advanced Engineering Mathematics By Erwin Kreyszig ·
(scientific journals, reports)	2020
Electronic References, Websites	https://www.sanfoundry.com/best-reference-books-
	numerical-methods/

13.	Course Name:
Engineerin	g Analysis
14.	Course Code:
CE 3102	
15.	Semester / Year:
Semester	1/ 3rd
16.	Description Preparation Date:
17/3/2024	·
17.Avail	able Attendance Forms:
Atten	idance
18.Numl	per of Credit Hours (Total) / Number of Units (Total)
4  hrs.	/Week
19. Name	Course administrator's name (mention all, if more than one name)
Name Emai	e: Dr. Mustsis Sami Anmed
EIIIdi	i: mustara.sa.anmed@uotecimology.edu.iq
20.	Course Objectives
Course Object	tiv $ullet$ To develop problem solving skills and understanding of , Eign values and E
	vectors through the application of techniques.
	• To understand the Definition of Z-Transform , Region of convergence
	Application of ZT.
21.	Teaching and Learning Strategies
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of sampling activities that are interesting to the students.

22. Course Structure							
W e Hours k	Required Learning Outcomes	Unit or subject name		Evaluatio n method			
16 1 ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	<ol> <li>We start with a basic and thorough introduction to eigenvalue problems in week 2 and explain with several simple matrices. This is followed by a section devoted entirely. We show you these diverse examples to train your skills in modeling and solving eigenvalue problems. Eigenvalue problems for real symmetric, skew- symmetric, and orthogonal matrices are</li> </ol>	Fourier TransformFourier transforms andinverse.Properties,convolution theorem powerspectral density andconvolution signals andlinear system applications.Discrete Fourier Transform(DFT), Inverse DFT. FastFourier Transform (FFT),and IFFT. Applications inelectrical engineering.The Z-Transform:Definition of Z-Transform	Attend ance Attend ance	Quizze LO #(1&2), (5&6), (9&10) and (12&13)s Assignme nts LO # 1-			
EJ ;; @ ;; F	orthogonal matrices are discussed in week 3, and their complex counterparts (which are important in modern physics) in week 3. In week 4 we show how by diagonalizing a matrix, we obtain its eigenvalues. 2. The z-transform, which extends the DTFT	Definition of Z-Transform (ZT), ZT of some elementary functions, properties of Z-transform, Region of convergence, The inverse of Z-Transform; partial fraction inversion, power series inversion, Application of ZT to difference equation.		13			
4	to the analysis of discrete-time systems.	Mid-term Exam	Attend ance	LO # 1-7			
9 ; 1 0 12 ; 1	3. algebraic methods can solve the linear ODEs with constant coefficients, and their solutions are elementary functions known from calculus. For ODEs with variable coefficients, the situation is more complicated, and their solutions may be nonelementary functions. Legendre's, Bessel's, and the	Matrix Analysis Review of matrix theory, linear transformation, Eign values and Eign vectors, Laplace transform of matrices, vector spaces, orthogonal transformations and matrices, unitary matrix, complex vector space, diagonalization	ance				

	hypergeometric equations are important ODEs of this kind. Since these ODEs and their solutions, the Legendre polynomials, Bessel functions, and hypergeometric functions play an important role in engineering modeling, we shall consider the two standard methods	Hami Quad applio to ele	lton theorem, ratic form, and cation of matrices ctric circuits.	Attend		
12 12 13 ;14 ;15	for solving such ODEs. The transition from "real calculus" to "complex calculus" starts with a discussion of complex numbers and their geometric representation in the complex plane. We then progress to analytic functions in week 12. We desire functions to be analytic because these are the "useful functions" in the sense that they are differentiable in some domain and operations of complex analysis can be applied to them. The most important equations are therefore the Cauchy–Riemann equations in week 13 because they allow a test of the analyticity of such functions	Solution equation Idea of methoop power operation generation function function	on of differential ons by power series of the power series d, Theory of the series method, tons on power serie, l solution. Bessel on of the first and l order's equation, dre kinds, and Bessel on properties.	Attend ance		
23. C	ourse Evaluation					
Distribut preparati	ing the score out of $100$ at ing the score out of $100$ at ing the second state of t	accordin r written	g to the tasks assigned to exams, reports etc	o the stu	dent such $\overline{as}$	daily
24. Le	earning and Teaching F	Resourc	es			
Required	textbooks (curricular books	s, if any)				
Main refe	rences (sources)		1- Kellaway, F. Mathematics. B 68s.(Wiley.)." 53.386 (1969):	W. "Adva byErwin Kro The Matl 444-444.	anced Enginee eyszig. Pp. xx, hematical Gaz	∍ring 899. zette

2- Ambardar, Ashok. *Analog and digital signal processing*. BOSTON, MA: PWS, 1995. Chapter (9).

Recommended	books and	references
(scientific journals	s, reports)	
Electronic Referen	nces, Websites	

25. Course Evaluation	
Distributing the score out of 100 according	to the tasks assigned to the student such as daily
preparation, daily oral, monthly, or written	exams, reports etc
26. Learning and Teaching Resource	28
Required textbooks (curricular books if any)	K.Ogata "Modern Control Engineering"
	Prontico Holl Dub
	riennice - mail rub.
Main references (sources)	F.Colnaraghi & B.C. Kuo "Automatic
	Control Systems",9-th ed.
	John Wiley &Sons ,Inc.
Recommended books and references	
(scientific journals, reports)	
Electronic References, Websites	

1. Course Name:								
Control Engineering I								
2.	2. Course Code:							
CE 31	03							
3.	Seme	ster / Year:						
1st / 2	2023-2	2024						
4.	Descr	iption Prepara	tion Date:					
2024/3	3/20	r						
5.	Availa	ble Attendance	Forms:					
	Contii	nuous/quarter	·ly					
6.	Numb	er of Credit Ho	urs (Total) / N	Sumber of Units (T	otal)			
7	<u>30</u> Cours	e administrat	or's name (m	ention all if more	than one	name)		
	Name	: nihad mohm	ied ameen			ilaino)		
	Email	nihad.m.ame	een@uotech	nology.edu.iq				
8.	Cours	e Objectives						
Course	Objecti	ves	1. Evaluation	of mathematical mo	del, time res	oonses and		
			response analysis.					
			2. Analysis of	time responses and	stability.			
			3. Evaluating	system stability.				
а.	Teach	ing and Learnir	ng Strategies					
Strategy	y	A1: Empow	er the student to become familiar with ways to find the					
		function ar	nd state space	representation.	ystem using	uansiei		
		A2: Unders	tanding the fin	rst, second and high	her order tin	ne		
		A3. Evalua	ting system st	ability.				
b. C	b. Course Structure							
Week	Hours	Required Lear	rning	Unit or subject	Learning	Evaluation		
		Outcomes		name	method	method		
1	2	1. Importance of in advancement	control system of engineering	Introduction to control system	class lectures.	Discussions examination		
		and science in ad	dition to its	-	and			
		vehicle missile g	guidance and		lectures			
		aircraft-piloting	system					

		2 advance in the theory and					
		<ul> <li>2.advance in the theory and</li> <li>practice of automatic control 3.</li> <li>themethods used in control</li> <li>system</li> <li>4.some definitions used in</li> <li>conrol system</li> <li>5.introduction to open loop and</li> <li>closed loop system</li> </ul>					
2	4	Linear system, non linear system, transfer functions, mechanical translation system, mechanical rotational system, communication systems	Mathematical model or physical system.	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
3	4	Procedures for drawing a block diagram, block diagram reduction, closed loop system subjected to a disturbance, multivariable Systems, transfer matrices, transfer function of a second-order prototype system.	Block diagram	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
4	2	Signal flow graph representation of linear system, Mason's gains formula for signal flow graph.	Signal flow graphs	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
5	4	How to derive transfer function fr the state space equations, state-space representation of dynamic system	Modeling in state spac	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
6	10	Test signals, impulse response function, first order system, higher order system, deflnitions of time constant, damping ratio and natural frequency, definitions of transient response specifications, impulse response, dominant poles	Transient response analysis	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
7	2	Classifications of control systems static position error coefficients, dynamic error coefficients	Steady - state error in unity- feedback contro svst	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
8	2	Routh's stability criterion, special cases, application of Routh's stability criterion to control system	Routh's stability criter	class lectures and electronic lectures	Discussions, examination, home works, quizzes		
c. Course Evaluation							

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

d. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	K.Ogata "Modern Control Engineering" Prentice - Hall Pub.
Main references (sources)	F.Colnaraghi & B.C. Kuo "Automatic Control Systems" ,9-th ed.John Wiley &Sons ,Inc.
Recommended books and references	
(scientific journals, reports)	
Electronic References, Websites	

Digital communication 1       28. Course Code:         CE 3104       29. Semester / Year:         29. Semester / Year:       1st / 2023-2024         30. Description Preparation Date:       2024/3/20         31.Available Attendance Forms:       Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6       33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         Exercises         Quizzes         Quizzes       Quizzes         Quizzes       Quizzes         Quizzes       Sampling Theory       in person         Outcomes       Sampling of band pass       Quizzes. Home-works. Processions. and pointerior works. Proces	27	27. Course Name:						
28.       Course Code:         CE 3104       29.       Semester / Year:         1st / 2023-2024       30.       Description Preparation Date:         2024/3/20       31. Available Attendance Forms:       2024/3/20         31. Available Attendance Forms:       Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)       45/6         33.       Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34.       Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study the types of line coding.         e. Calculating the signal to noise ratio.         e. Teaching and Learning Strategies         Strategy       Lectures         Exercises       Quizzes         Quizzes       Homework         f.       Course Structure         Week       Hours       Required       Unit or subject name       Learning method         1       3       a, b       Sampling Theory       in person       Onizers.Homeworks.         1       3	Digita	Digital communication I						
$\begin{array}{c c c c c c } \hline CE 3104 & \hline Centre Vear: \hline Cent$	28	. (	Course Co	ode:				
29. Semester / Year:         1st / 2023-2024         30. Description Preparation Date:         2024/3/20         31.Available Attendance Forms: Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6         33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study the types of line coding.         e. Calculating the signal to noise ratio.         e. Teaching and Learning Strategies         Strategy         Lectures         Exercises         Quizzes         Homework         f.       Course Structure         Week       Hours       Required       Unit or subject name       Learning         Outcomes       Sampling of band pass       Outzes, Home-works, Discustors, and Discustor	CE 31	.04						
1st / 2023-2024         30.       Description Preparation Date:         2024/3/20         31. Available Attendance Forms: Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6         33.       Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34.       Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study of types of pulse modulation.         d. Study of types of pulse modulation.         e. Teaching and Learning Strategies         Strategy       Lectures         Exercises       Quizzes         Homework       Incertify         f.       Course Structure         Week       Hours       Required         Unit or subject name       Learning         Outcomes       Sampling Theory         1       3       a, b       Sampling of band pass         2       3       a, b       Sampling of band pass	29	. 9	Semester	/ Year:				
30.       Description Preparation Date:         2024/3/2∪         31.Available Attendance Forms: Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6         33.       Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34.       Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         b. Study of sampling the coding.         c. Calculating the signal to noise ratio.         e.         Exercises         Quizzes         Homework         f.       Ceurse Structure         Week       Hours       Required         Learning       Outcomes         1       3       a, b       Sampling Theory         1       3       a, b       Sampling of band pass         2       3       a, b       Sampling of band pass	1st / 2	2023-2	024					
2024/3/20         31.Available Attendance Forms: Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6         33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         Course Objectives         a. Know how to send and receive signats using types of digital modulation.         b. Study of types of pulse modulation.         b. Study of types of pulse modulation.         a. Calculating the signal to noise ratio.         e. Teaching and Learning Strategies         Strategy         Lectures         Exercises         Quizzes         Homework         f.         Course Structure         Week         Mourses         Sampling Theory         Mainterione. <t< td=""><td>30</td><td>. I</td><td>Descriptio</td><td>on Prep</td><td>aration Date:</td><td></td><td></td></t<>	30	. I	Descriptio	on Prep	aration Date:			
31.Available Attendance Forms: Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6         33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study the types of line coding.         e. Calculating the signal to noise ratio.         e. Teaching and Learning Strategies         Strategy         Lectures         Exercises         Quizzes         Homework         f.       Required         Learning       method         Quizzes.         Homework         f.       Sampling Theory         1       3, b       Sampling of band pass         2       3       a, b       Sampling of band pass	2024/	3/20						
Continuous/quarterly         32.Number of Credit Hours (Total) / Number of Units (Total)         45/6         33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         Course Objectives         a. Know how to send and receive signals using types of digital modulation.         other types of pulse modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study of types of pulse modulation. <td co<="" td=""><td>31.</td><td>.Availał</td><td>ole Attend</td><td>lance Fo</td><td>orms:</td><td></td><td></td></td>	<td>31.</td> <td>.Availał</td> <td>ole Attend</td> <td>lance Fo</td> <td>orms:</td> <td></td> <td></td>	31.	.Availał	ole Attend	lance Fo	orms:		
32.Number of Credit Hours (Total) / Number of Units (Total)         45/6       33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         a. Know how to send and receive signals using types of digital modulation.         Study of sampling theory and its applications.         c. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study of types of line coding.         e. Calculating the signal to noise ratio.         Meework         f. Course Structures         Exercises		Contin	uous/qua	arterly				
43/0         33. Course administrator's name (mention all, if more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study of types of line coding.         c. Calculating the signal to noise ratio.         e. Teaching and Learning Strategies         Strategy         Lectures         Exercises       Quizzes         Homework       Unit or subject name       Learning method         1       3       a, b       Sampling Theory       in person       Quizzes, Home-works, Discussions, and Examinations.         2       3       a, b       Sampling of band pass       Quizzes, Home-works, Discussions, and Examinations.	32.	.Numbe	r of Cred	it Hours	(Total) / Number of U	Jnits (Total)	)	
Solution and its analytic of a name (memori an, it more than one name)         Name: Assist.Professor Hussain Abdul Karim Hammas Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study of types of pulse modulation.         d. Study of types of pulse modulation.         d. Study of types of pulse modulation.         e. Teaching and Learning Strategies         Strategy         Lectures         Exercises         Quizzes         Hours       Required         Learning       Unit or subject name         Learning       Outcomes         1       3       a, b         Sampling of band pass       in person         2       3       a, b	45/6	(		dminist	rator's name (menti	on all if mo	ore than one	
Name: Assist.Professor Hussain Abdul Karim Hammas         Bit Section       Email: hussain.a.hammas@uotechnology.edu.iq         34.       Course Objectives         a. Know how to send and receive signals using types of digital modulation.       b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.       b. Study of types of pulse modulation.         d. Study the types of line coding.       e. Calculating the signal to noise ratio.         e.       Teaching and Learning Strategies         Strategy       Lectures         Exercises       Quizzes         Homework       Interview         f.       Course Structure         Week       Hours       Required       Unit or subject name       Learning         1       3       a, b       Sampling Theory       in person       Discussions, and Examinations.         2       3       a, b       Sampling of band pass       Quizzes, Home-works, Discussions, and Examinations.	- 55	name)		ummisi	rator 3 hame (mentio	Jir all, li fiic		
Email: hussain.a.hammas@uotechnology.edu.iq         34. Course Objectives         Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study the types of line coding.         e. Calculating the signal to noise ratio.         e. Calculating the signal to noise ratio.         Exercises         Quizzes       Unit or subject name       Learning       Evaluation method         Method         Method         Discussions, and         Discussions, and         Course Sampling of band pass       Quizzes, Home-works, Discussions, and         Discussions, and Evanimations, and		Name:	Assist.Pr	ofessor	Hussain Abdul Karir	n Hammas		
34. Course Objectives         Course Objectives         a. Know how to send and receive signals using types of digital modulation.         b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study the types of line coding.         e. Calculating the signal to noise ratio.         f. Courses structures         Exercises         Quizzes         Hours       Required       Learning       Evaluation method         Learning       Outcomes       In person       Discussions, and       Examinations.         1       3. b       3. b       Sampling of band p		Email:	hussain.a	a.hamm	as@uotechnology.ed	u.iq		
Course Objectives       a. Know how to send and receive signals using types of digital modulation.       b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.       d. Study of types of pulse modulation.       d. Study of types of pulse modulation.         d. Study the types of pulse modulation.       d. Study the types of line coding.       e. Calculating the signal to noise ratio.	34	. (	Course Ol	biectives	3			
or any system of signal terms of your or signal terms of yo	Course	Objectiv		a. Know	how to send and receive sig	nals using type	s of digital	
b. Study of sampling theory and its applications.         c. Study of types of pulse modulation.         d. Study the types of line coding.         e. Calculating the signal to noise ratio.         e. Calculating the signal to noise ratio.         e. Calculating the signal to noise ratio.         strategy       Lectures         Strategy       Lectures         Quizzes       Homework         f.       Curse Structure         Week       Hours       Required       Unit or subject name       Learning       Evaluation method         Learning       Outcomes       In person       Ouizzes, Home-works, Discussions, and       Examinations.         1       3       a, b       Sampling of band pass       In person       Quizzes, Home-works, Discussions, and         2       3       a, b       Sampling of band pass       Quizzes, Home-works, Discussions, and	000100	0.0,000.1		modul	ation.			
c. Study of types of pulse modulation.       d. Study the types of line coding.       e. Calculating the signal to noise ratio.         e. Calculating the signal to noise ratio.       e. Calculating the signal to noise ratio.       e. Calculating the signal to noise ratio.         Strategies				b. Study	of sampling theory and it	s applications	s.	
d. Study the types of line coding.       e. Calculating the signal to noise ratio.         strategy       Lectures         Exercises       Exercises         Quizzes       Homework         f. Course Structure       Unit or subject name       Learning         Meek       Hours       Required       Unit or subject name       Learning         1       3 , b       Sampling Theory       in person       Discussions, and Examinations.         2       3 , a, b       Sampling of band pass       Quizzes, Home-works, Discussions, and Examinations.       Discussions and Examinations.				c. Study	of types of pulse modulation	1.		
e. Calculating the signal to noise ratio.         e. Teaching and Learning Strategies         Strategy       Lectures Exercises Quizzes Homework         f. Course Structure         Week       Hours       Required Learning       Unit or subject name Learning       Learning method       Evaluation method Biscussions, and Examinations.         1       3 d, b       Sampling of band pass Single       Sampling of band pass Single       Quizzes, Home-works, Discussions, and Examinations.				d. Study	the types of line coding.			
<ul> <li>e. Teaching and Learning Strategies</li> <li>Strategy Lectures Exercises Quizzes Homework</li> <li>f. Course Structure</li> <li>Week Hours Required Unit or subject name Learning Dutcomes</li> <li>1 3 a, b</li> <li>2 3 a, b</li> <li>Sampling Theory in person</li> <li>Quizzes, Home-works, Discussions, and Examinations.</li> <li>Quizzes, Home-works, Discussions, and Examinations.</li> </ul>				e. Calcul	ating the signal to noise ration	0.		
StrategyLectures Exercises Quizzes Homeworkf.Curse StructureWeekHoursRequired Learning OutcomesUnit or subject name methodLearning methodEvaluation method13a, bSampling Theory In personin person Evaluations.Quizzes, Home-works, Discussions, and Examinations.23a, bSampling of band pass Evaluation personQuizzes, Home-works, Discussions, and Examinations.	е.	Teachir	ng and Le	earning	Strategies			
Exercises Quizzes Homeworkf.Course StructureWeekHoursRequired Learning OutcomesUnit or subject name methodLearning methodEvaluation method13a, bSampling Theory in personIn personQuizzes, Home-works, Discussions, and Examinations.23a, bSampling of band pass signalQuizzes, Home-works, Discussions, and Examinations.	Strateg	y Lect	ures					
Quizzes Homeworkf.Course StructureWeekHoursRequiredUnit or subject nameLearning methodEvaluation methodLearningOutcomesImage: Colspan="3">Outcomes13a, bSampling Theoryin personQuizzes, Home-works, Discussions, and Examinations.23a, bSampling of band passQuizzes, Home-works, Discussions, and Examinations.		Exel	rcises					
f.Course StructureWeekHoursRequiredUnit or subject nameLearning methodEvaluation methodLearningOutcomesImage: Constraint of the subject nameImage: Constraint of the subject nameImage: Constraint of the subject name13a, bSampling Theoryin personQuizzes, Home-works, Discussions, and Examinations.23a, bSampling of band passQuizzes, Home-works, Discussions, and Examinations.		Homework						
WeekHoursRequired Learning OutcomesUnit or subject name methodLearning methodEvaluation method13a, bSampling Theoryin personQuizzes , Home-works , Discussions , and Examinations.23a, bSampling of band passQuizzes , Home-works , Discussions , and Examinations.	f. Course Structure							
Learning Outcomesmethod13a, b23a, bSampling of band pass circultQuizzes , Home-works , Discussions , and Examinations.	Week Hours Required Unit or subject name Learning Evaluation method							
OutcomesImage: Constraint of the second			Learning method					
13a, bSampling Theoryin personQuizzes, Home-works, Discussions, and Examinations.23a, bSampling of band passQuizzes, Home-works, Discussions, and Examinations.			Outcomes					
2     3     a, b     Sampling of band pass     Quizzes, Home-works,	1	3	a, b		Sampling Theory	in nerson	Quizzes, Home-works, Discussions, and	
2 3 a, b Sampling of band pass Quizzes, Home-works, Discussions and						in person	Examinations.	
signal in norgani Discussions and	2 3 a, b		a, b		Sampling of band pass	in nerson	Quizzes, Home-works, Discussions, and	
Examinations.							Examinations.	

3	3 3 a, b Review of Pulse Quizzes, Home-works,							
		, ~~	Modulation	in person	Discussions, and			
				Examinations.				
4	3	a, c	Pulse Code Modulation	e Code Modulation				
				in person Discu				
_					Examinations.			
5	3	a, c	Quantization process	in person	Quizzes, Home-works,			
					Examinations			
6	2		Noise in PCM	in noncon	Ouizzes Home-works			
0	3	a, c		in person	Discussions . and			
					Examinations.			
7	3	a.d	S/N Performance of PCI	in person	Quizzes, Home-works,			
,	0	u, u		in person	Discussions, and			
					Examinations.			
8	3		Delta Modulation	in person	Quizzes, Home-works,			
		a, d		•	Discussions, and			
					Examinations.			
9	3	,	Delta-Sigme	in person	Quizzes, Home-works,			
		a, d	modulation		Discussions, and			
10	2		A dantiya dalta madulati		Ouizzes Home-works			
10	3	2.4		in person	Discussions . and			
		a, c			Examinations.			
11	3		Equalization ty	in nerson	Quizzes, Home-works,			
11	5	a.e	;Matching filter	in person	Discussions, and			
		,		Examinations.				
12	3		Digtal Base-B	in person	Quizzes, Home-works,			
		a, e	Transmission	-	Discussions, and			
					Examinations.			
13	3		Line coding and propert	Quizzes, Home-works,				
		a, e			Examinations			
14	2		Nyauist criterion for zer	in norcon	Quizzes Home-works			
14	3	2 0	ISI	in person	Discussions, and			
		a, c	101		Examinations.			
15	3		Matched filter reciver	in person	Quizzes, Home-works,			
10	0	a, e	Discussions,					
	Examinations.							
g. Course Evaluation								
quarterly exams 30% Daily exams homework discussions 10%								
qualte			s, nome work, uiscussiolis	10/0.				
n. L	earning	and reaching Re	esources					
Requir	ed textbo	oks (curricular books	s, if $a_{1-Analog}$ and digital co	ommunication Sy	stems, Martin S. Roden			
		,	3 <sup>rd</sup> edition prentice Hal	11.				
			2 Digital communicati	on Glovor bC-	nt prentice Uall			
			2- Digital communicati	oli ,Glover &Gra	int, prenuce Han.			
Main r	eference	s (sources)	Communication System	ns, S. Haykin , Jo	hn Willy & Sons.			
					-			
			11					

Recommended books and references	Modem Analog and digital communication Systems, B.P.Lathi, Ox Univ.Press.
(scientific journals, reports)	
Electronic References, Websites	

1. Course	e Name:					
Microwave	Microwave Engineering					
2. Course	e Code:					
CEM 3105	CEM 3105					
3. Semest	ter / Year:					
$1^{st}/3^{rd}$	1 <sup>st</sup> /3 <sup>rd</sup>					
4. Descri	ption Preparation Dat	e:				
31.03.2024	4					
5. Availal	ble Attendance Forms:					
Weekly	y or of Cradit Hours (Tots	1) / Number of Units (Total)				
<u> </u>	er of Credit Hours (Tota	ii) / Number of Omits (Total)				
7. Course	e administrator's nam	e (mention all, if more than	n one name	e)		
Name: Fmail:	Dr. Mohammed A. Aze	eez wotechnology edu ig				
8. Course	Objectives	uoteennoiogy.euu.iq				
Course Objectiv	res This course aims to he	lp the students understanding the	basics of Mi	crowave		
	theory and techniques	. It also intends to introduce the a	pplications of			
	Microwave Engineering	g in the modern communication sy	stems.			
	By the end of this cou	rse, the students should be able to	o understand	basic		
	Microwave electromage	netic structures, analyze Microwav	e networks.			
9. Teaching and Learning Strategies						
Strategy 7 C V	detailed derivations of important formulas in classroom lectures, p well-designed laboratory practice to help students understand t physics behind the theories.					
10. Course S	Structure					
Week Hours	Required Learning	Unit or subject name	Learning	Evalua		
	Outcomes		method	metho		
				d		

1-2       6       1. Demonstrate knowledge and understanding of wave equation for time varying fine varying va	1-2       6       1. Demonstrate knowledge and understanding of wave equation for time varying field wave engineering problems       Place-Based Learning diademic field wave engineering endits surfare the varying field wave engineering endits ware introduction to ADS microwave CAD software the varying field wave engineering matrix surfare field wave engineering matrix surfare field wave engineering endits wave transmission line is structure properties.       Place-Based Learning diademic wave field wave engineering endits wave framewave engineering endits wave transmission lines (TL): Derivatio Place-Based learning and scattering matrix wave enditions of TL equations, parameters and envorks using incedance and equivalent voltages a Currents in produce and admittance wave transformer.       Place-Based learning       Quizze         5-6-7       8       8       Software transmission lines (TL): Derivation of TL equations, parameters and quarter wave transformer.       Place-Based learning       Quizze         7-8-9       8       8       Currents is signal flow graphs, Mason's rule. Discontinuities and manalysis; Impedance and admittance wave guides-electric and magnetic currents, excitation of waveguides perture coupling. Impedance Mathing: Impedance	•					1
11. Course Evaluation         Distributing the score out of 100 according to the tasks assigned to the student such as dail preparation, daily oral, monthly, or written exams, reports etc         12. Learning and Teaching Resources         Required textbooks (curricular books, if an Microwave Engineering: Pozar, David M. 4th ed         Main references (sources)         1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Colling         3. Theory and Design of Microwave Filters, Ian Hunter, 2001	11. Course Evaluation         Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc         12. Learning and Teaching Resources         Required textbooks (curricular books, if an Microwave Engineering: Pozar, David M. 4th ed         Main references (sources)       1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin         3. Theory and Design of Microwave Filters, Ian Hunter, 2001         Recommended books and references (scientific journals, reports)         Electronic References Wabritos	1-2 6 3-4-5 6 5-6-7 6 7-8-9 8	6 8 8 8	<ol> <li>Demonstrate knowledge and understanding of wave Equation method by solving microwave engineering problems</li> <li>Analyze of transmission line to determine its circuit properties.</li> <li>Analyze typical microwave networks using impedance, admittance, transmission and scattering matrix representations.</li> <li>Design microwave matching networks using L section, single and double stub and quarter wave transformer.</li> </ol>	Electromagnetic Waves: Wave equation for time varying fields And boundary conditions; plan waves dialectic and conducting media; surfa Impedance and transmission lines, Introduction to ADS microwave CAD Software Transmission Lines (TL): Derivatio and Solution of TL equations, parameters and Characteristics of TL; High frequency Effects, transients on TL; Coaxial TL; Strip lines; rectangular wave; circular wave. Microwave Network Analysis: Impedance and equivalent voltages a Currents; impedance and admittance Matrices; network analysis; the scattering matrix , Transmission (ABCD) matrix, signal flow graphs, Mason's rule. Discontinuities and mo analysis, Excitation of waveguides-electric and magnetic currents; excitation of waveguides aperture coupling. Impedance Matching: Impedance matching, impedance transformers, matching networks. Single and double stub tuned desi quarter-wavelength transformers, multisession matching transformers step-lines and waveguide.	Place-Based Learning Place-Based Learning Place-Based Learning	Quizzes Quizzes Quizzes
Distributing the score out of 100 according to the tasks assigned to the student such as dail preparation, daily oral, monthly, or written exams, reports etc 12. Learning and Teaching Resources Required textbooks (curricular books, if an Microwave Engineering: Pozar, David M. 4th ed Main references (sources) 1.Microwave Engineering: Pozar, David M. 4th ed 2.Foundations for Microwave Engineering, Robert E. Collin 3. Theory and Design of Microwave Filters, Ian Hunter, 2001	Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc         12. Learning and Teaching Resources         Required textbooks (curricular books, if an Microwave Engineering: Pozar, David M. 4th ed         Main references (sources)         1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin         3. Theory and Design of Microwave Filters, Ian Hunter, 2001         Recommended books and references         (scientific journals, reports)	11 C	Course	Evaluation			
Instruction gaine before out on root according to the table assigned to the statement	Preparation, daily oral, monthly, or written exams, reports etc         12. Learning and Teaching Resources         Required textbooks (curricular books, if an         Main references (sources)         1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin         3. Theory and Design of Microwave Filters, Ian Hunter, 2001         Recommended books and references         (scientific journals, reports)	Distribut	ting the	e score out of 100 accordin	ng to the tasks assigned to the st	udent such a	s daily
12. Learning and Teaching Resources         Required textbooks (curricular books, if an         Main references (sources)         Main references (sources)         1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin         3. Theory and Design of Microwave Filters, Ian Hunter, 2001	12. Learning and Teaching Resources         Required textbooks (curricular books, if ar       Microwave Engineering: Pozar, David M. 4th ed         Main references (sources)       1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin       3. Theory and Design of Microwave Filters, Ian Hunter, 2001         Recommended books and references (scientific journals, reports)       Electronic References	preparat	tion, da	ily oral, monthly, or writt	en exams, reports etc		.5 dully
Required textbooks (curricular books, if an       Microwave Engineering: Pozar, David M. 4th ed         Main references (sources)       1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin       3. Theory and Design of Microwave Filters, Ian Hunter, 2001	Required textbooks (curricular books, if an       Microwave Engineering: Pozar, David M. 4th ed         Main references (sources)       1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave Engineering, Robert E. Collin       3. Theory and Design of Microwave Filters, Ian Hunter, 2001         Recommended books and references (scientific journals, reports)       Electronic References	12. L	earning	g and Teaching Resou	Irces		
Main references (sources)       1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave         Engineering, Robert E. Collin         3. Theory and Design of Microwave         Filters, Ian Hunter, 2001	Main references (sources)       1.Microwave Engineering: Pozar, David M. 4th ed         2.Foundations for Microwave         Engineering, Robert E. Collin         3. Theory and Design of Microwave         Filters, Ian Hunter, 2001         Recommended books and references         (scientific journals, reports)	Required	l textboo	oks (curricular books, if an	Microwave Engineering: Pozar, David	l M. 4th ed	
2.Foundations for Microwave Engineering, Robert E. Collin 3. Theory and Design of Microwave Filters, Ian Hunter, 2001	2.Foundations for Microwave         Engineering, Robert E. Collin         3. Theory and Design of Microwave         Filters, Ian Hunter, 2001         Recommended books and references         (scientific journals, reports)	Main refe	erences	(sources)	1.Microwave Engineering: Pozar, Dav	rid M. 4th ed	
Engineering, Robert E. Collin 3. Theory and Design of Microwave Filters, Ian Hunter, 2001	Engineering, Robert E. Collin         3. Theory and Design of Microwave         Filters, Ian Hunter, 2001         Recommended books and references         (scientific journals, reports)				2.Foundations for	Microw	ave
3. Theory and Design of Microwave Filters, Ian Hunter, 2001	3. Theory and Design of Microwave         Filters, Ian Hunter, 2001         Recommended books and references         (scientific journals, reports)				Engineering, Rober	rt E. Col	lin
Filters, Ian Hunter, 2001	Filters, Ian Hunter, 2001       Recommended books and references (scientific journals, reports)       Electronic References, Websites				3. Theory and Design of N	Aicrowave	;
	Recommended books and references (scientific journals, reports)				Filters, Ian Hunter, 2001		
Recommended books and references	(scientific journals, reports)	Recomm	ended	books and references			
(scientific journals, reports)	Electronic References, Websites	(scientific	c journa	ls, reports)			
		Electronic	c Refere	ences, Websites			

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1.	Course	e Name:				
	Signals &Systems I					
2.	Course	Code:				
	CE 310	6				
3.	Semester / Year:					
	First Se	mester/THIR	D Year			
4.	Descrip	tion Prepara	tion Date:			
	1/2/202	24				
5.	Availab	le Attendance	Forms:			
	Face-to	-face class at	tendance			
6.	Number	r of Credit Ho	urs (Total) / Number of Units (Total)	)		
7	$\frac{2/2}{2}$	administrat	via name (mention all if more the			
1.	Name: Dr	: Mohammed Hu	ssein mirv	an one nan	ne)	
	Email: M	ohammed.H.Miry	@uotechnology.edu.iq			
8.	Course	Objectives				
Course	<ul> <li>Construction of relation of relation concepts of signals and systems.</li> <li>Learn about the properties, characteristics, and analysis of signals and systems.</li> <li>Study the principles and techniques used in acquiring and processing signals.</li> <li>Explore the various systems that generate and regulate signals.</li> <li>To gain knowledge about signal processing techniques as applied to signals and systems.</li> <li>To get skills in implementing and processing various signals and systems through simulation programming.</li> <li>To foster critical thinking and problem-solving abilities in analyzing and interpreting signals and systems</li> </ul>					
9.	Teachir	ig and Learnir	ng Strategies			
Strategy	rategy       • Lecture presentation         • Tutorials         • Experimental learning					
10. C	ourse S	tructure				
Week	Hours	Required	Unit or subject name	Learning	Evaluation	
	Learning			method	method	
		Outcomes				
1	2	Understand the	Derivatives and Integrals, Sinusoids –	le		
		basic concepts	amplitude, phase, Complex numbers, Phasors.	20		

		of circula 0		hla Eventiona Olaasifiaation		<b>E</b> venin etie	
2	2	of signals &	Physically Realiza			Examinatio	
		systems	Or Signais, Contin			ns,	
			Continuous vs. C	ontinuous lime		Homework,	
						and	
						Reports	
3	2		Even and Odd Fi	unctions, Periodic Functions,			
			Sinusoidal Function	on of Time, Phase, Sinusoids,			
4	2	Get skills in the	Important Discont	inuous Functions, Function		Ц	
		analysis	Transformations,	Energy and Power		Xai	
5	2	methods of	Definition of Syste	em		nin	
6	2	signals and	General System,	Input-Output Relationships		latic	
7	2	Systems	System Properties	5.		ons,	
8	2		Definition, Graphi	cal Illustration, Calculating	Le	Ho	
			Intervals, Duration	n of Convolution	ctu	me	
9	2	Gain knowledge	Examples, Convo	lution properties, Commutative	res	WO	
		about signal	Property, Distribut	tive Property, Associative		rk,	
		processing	Property, Derivati	ve, Time-shifting		an	
10	2	techniques as	Convolution involv	ving a periodic function,		d R	
		applied to	Duration, Location	n, Shape, Convolution Applied		lep	
		signals and	to LTI Systems, In	mpulse Response.		orts	
11	2	systems.	Definition, Auto and Cross Correlations,				
			Graphical Illustration				
12	2		Calculating Interve	als, Duration of Correlation			
13	2		correlation prope	rties, Detection by Correlation			
14	2		Impulse Respo	nse, Homogeneous Linear			
			Differential Equati	on,			
15	2		2nd Order Linear	Homogeneous			
			Differential Equation	on.			
11.	Course	Evaluation					
1.       Classroom activity: 2 Marks       2.       Quizzes: 5 Marks       3.       Homework: 3 Marks							
12 Learning and Teaching Resources							
Doquir	ad toythe	oke (ourrigular b		_			
			ours, ii ally)	Signals and Systems			
Main re	eferences	(sources)		<ul> <li>Signals and Systems.</li> <li>By Simon Haykin, and Barry V</li> <li>SIGNALS SYSTEMS C</li> <li>By Rodger E. Ziemer, William</li> </ul>	/an Veen. ontinuous and H. Tranter, and	Discrete. d D. Ronald Far	
Recom	mended	books and	references	• Digital Signal Processing:	Fundamentals	and Applicati	
(scienti	ific journa	als, reports)		by Li Tan.			
Electro	nic Refer	ences, Websites	3	-			
				1			

