

Detailed Course Description - Course Plan Development and Updating Procedures/ ..... Department	QF01/0408-3.0E
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Faculty	Science	Department	Mathematics
Course number	0101352	Course title	Complex Analysis 1
Number of credit hours	3	Pre-requisite/co-requisite	تحليل حقيقي 1 0101251

**Brief course description:** Complex numbers and operations, functions of complex variable, derivative complex function and integrals.

Course goals and learning outcomes	
<b>Goal 1</b>	1. develop good skills at working with complex numbers and complex functions.
Learning outcomes	1.1 Students will be able to compute the arithmetic operations with complex numbers. 1.2 Students will be able to write algebraic and polar form of the complex number. 1.3 Students will be able to mapping the complex functions.
<b>Goal 2</b>	1. understand the main properties of analytic functions.
Learning outcomes	2.1 Students will be able to differentiate the complex functions. 2.2 Students will be able to distinguish analyticity and differentiation. 2.3 Students will be able to prove the analyticity of complex function.
<b>Goal 3</b>	1. compute limits, identify continuity, find derivative of different sorts of complex functions.
Learning outcomes	3.1 Students will be able to compute the limits of the complex functions . 3.2 Students will be able to calculate the derivative using the definition and the rules of differentiation. 3.3
<b>Goal 4</b>	1. find and compute integrals around closed curves.
Learning outcomes	4.1 Students will be able to calculate the integral of complex function along the contour. 4.2 Students will be able to compute integrals around closed curves. 4.3
<b>Textbook</b>	1.-Complex analysis , third edition by Dennis G. Zill & Patrick D. Shnahan. Jones & Bartlett LEARNING, 2015

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	2.- "Complex Variables and Applications" . By: R . Churchil and J. Brown McGraw-Hill, 7 <sup>th</sup> Edition (2003).
<b>Supplementary references</b>	1.- 2.- 3.-

#### Course timeline

Week	Number of hours	Course topics	Pages (textbook)	Notes
01	1 1 1	Complex Numbers: Sums and Products, Further Properties, Moduli.	3-9	
02	1 1 1	Complex Conjugates Exponential Form Products and Quotients in Exponential Form	16-27	
03	1 1 1	Roots of Complex Numbers Regions in the Complex Plane	22-33	
04	1 1 1	Functions of a Complex Variable Mappings.	47-71	
05	1 1 1	Theorems on Limits Limits Involving the Point at Infinity Continuity	103-120	
06	1 1 1	<b>First Exam 20%</b> Derivatives Differentiation Formulas	120-130	
07	1 1 1	Cauchy-Riemann Equations Sufficient Conditions for Differentiability	130-137	
08	1 1 1	Cauchy Riemann Equations in Polar System Analytic Functions	130-137	
09	1 1 1	Harmonic Functions	137-141	
10	1 1 1	The Exponential Function and Logarithmic Function	151-165	

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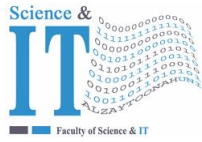
11	1 1 1	Derivatives of Logarithms Some Identities Involving Logarithms Complex Exponents	151-165	
12	1 1 1	Trigonometric Functions Hyperbolic Functions	171-182	
13	1 1 1	Inverse Trigonometric and Hyperbolic Functions Second Exam 20% Complex-Valued Functions $w(t)$	183-190	
14	1 1 1	Contours Contour Integrals	201-217	
15	1 1 1	Antiderivatives Cauchy-Goursat Theorem Simply and Multiply Connected Domains	218-226	
16	1 1 1	<b>Final Exam 50%</b>		

<b>Theoretical course evaluation methods and weight</b>	Participation = 10% First exam 20% Second exam 20% Final exam 50%	<b>Practical (clinical) course evaluation methods</b>	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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Approved by head of department		Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	D. Abdulkarim Farah	Office Number	127
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Office hours			



جامعة الزيتونة الأردنية  
Al-Zaytoonah University of Jordan  
كلية العلوم وتكنولوجيا المعلومات  
Faculty of Science and Information  
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"عراقة وجودة"  
"Tradition and Quality"

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