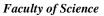
## Qualiy Assurance Project



Damanhour University





# **Course specification**

University/Academy: Damanhour University

Faculty/Institute: Science
Department: Mathematics

1. course Data:					
Course code:	Course title:		Academic year/level:		
Math 322	Functions of Complex Variables an Special Functions		2009-2010 Third year - Second term		
Specialization: Mathematics and Physics	No. of instruct  Lecture	ional units:  3 tutorial 2	practical -		
2. course Aim		Demonstrate theoretical knowledge and have practical skills in Functions of Complex Variables and special functions. Demonstrate an ability to initiate and sustain in-depth research relevant to Functions of Complex Variables and special functions. Have an opportunity to put theory into practice via work-based learning.			
3. Intended learning	3. Intended learning outcome				
a) Knowledge and ur	nderstanding	Functions of Comfunctions.  a2. Identify the step	nature and operations of aplex Variables and special os required to carry out a piece oic within Functions of Complex all functions.		
b) Intellectual skills		concepts relevant Variables and special b2. Analyze and integration of sources relevation.	erpret information from a variety ant to the topics under soned argument to the solution		

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	these topics ( see the contents).
c) Professional skills	c1. Plan practical activities using techniques and procedures of Functions of Complex Variables and special functions.
	c2. Execute a piece of independent research using numerical methods in different problems in mathematics.
d) General skills	d1. Develop appropriate effective written and oral communication skills relevant to Functions of Complex Variables and special functions.
	d2. Work effectively as part of a group, involving leadership, group dynamics and interpersonal skills such as listening, negotiation and persuasion relevant to mathematics.
	d3. Use organization skills (including task and time management) relevant to Functions of complex Variables and special functions, both individually and in a group situation.
	d4. Set tasks and solve problems relevant to numerical methods for solving specific problems of mathematics using ideas and techniques some of which are at the forefront of the discipline.
4. course content	Sets of Points in the Argand plane- Open and closed sets  –Domain- Gamma functions.
	Rectifiable curves- Jordan curves- Regular arcs- Fractional calculus
	Continuity and Differentiability of functions of complex variable f (z) – Analytic and regular functions- Cauchy-Riemann Differential Equations- Zeta function.
	Length of Regular arcs- Beta function.  Riemann's definition of integration of a function of complex variable over a contour and its basic properties  – Legendre polynomials.
	Cauchy's Integral Formulae-Associated Legendre polynomials
	Taylor's and Laurent Series of analytic functions - Bessel's functions.
	Zeros and multiple zeros of analytic functions -

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	Modified Bessle functions		
	Poles and residues of analytic functions- Hermite		
	polynomials.		
	Cauchyla Theorem of residues - Associated Laguerre		
	Caushy's Theorem of residues- Associated Laguerre polynomials.		
	Methods of contour Integration- Hyper geometric		
	functions.		
5. Teaching and learning	5.1 Lectures.		
methods	5.2 Tutorials		
	5.3 Homework		
	5.4 Oral discussion		
6. teaching and learning	Non		
methods for students with			
special needs			
· P			
7. Student Assessment			
a. Procedures used:	Final exam		
b. Schedule:	Assessment 1 Final exam Week 15		
c. Weighing of Assessment:	Final exam 150 Marks (100%)		
8. List of Textbooks and References:			
a. Course Notes	Course notes provided by the staff member of		
	Math department, to be handed at the beginning		

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	of the semester.
b. Required Books (Textbooks)	1-R.V.Churchill & J.W.Brown, Complex variables and
	applications, McGraw Hill Company, 1984.
	2- L. C. Andrews, Special functions of mathematics for
	engineers, McGraw Hill Company, 1992.
c. Recommended Books	F.W.J.Olver, Introduction to Asymptotics and special
	functions, Academic press, Inc, 1974.
d Daviodicals was situs ata	None
d. Periodicals, web sites,,etc	None

Course Instructor: Dr. Ragab Omer Abd El-Rahman

**Head of Department:** Prof. Dr. Mohamed Darwish

**Date:** / /