KINGDOM OF SAUDI ARABIA

Technical and Vocational Training Corporation

General Directorate of Curricula

المؤسسة العامة للتدريب التقني والمهني
Technical and Vocational Training Corporation

General Studies Department

General Courses

Department	General Studies	**Major**				
Course Name	Mathematics 1	**Course Code**	MATH 301			
Prerequisites	-	**Credit Hours**	4		**CTH**	6
		CRH	L 3	P 2	T	1

Course Description :

This course is designed to give the student basic knowledge of the Complex numbers and its operations. The exposition concentrates on key concepts and then elementary results concerning these numbers. The student has to know the basic notions of vector spaces and how to solve any linear systems of equations using Gauss-Jordan Elimination. Also, this course is designed to give the student an introduction to the first and second order linear differential equations and to solve initial value problem by Laplace Transforms.

General Objective:

This course aims at teaching the student the principle skills of some subjects that enable him to understand the specialized courses.

Detailed Objectives:

    Trainee will be able to:

1-	perform basic algebraic manipulation with complex numbers understand the geometric interpretation of complex numbers know methods of finding the nth roots of complex numbers and the solutions of simple polynomial equations
2-	solve linear systems easily apply correctly the row operations use Gauss-Jordan elimination to solve linear systems.
3-	identify Three-Dimensional Coordinate Systems. perform the basic operations on the vectors explain the Dot and the Cross Products. describe the Equations of Lines, Planes , Cylinders and Quadric Surfaces.
4-	identify and analyses ordinary differential equations. determine solutions to first order linear differential equations. determine solutions to second order linear homogeneous differential equations with constant coefficients.
5-	find Laplace transforms of given functions. find Laplace transforms using tables. use Laplace transforms to solve linear differential equations. be acquainted with solving initial value problem by Laplace transforms

Detailed of Theoretical Contents		
Hours	**Contents**	**Assessment Tools**
20	**Complex Numbers:** • Operation on complex number: addition, multiplication, division, conjugation in Algebraic form. • Geometric representation and Polar form. • Demoivre theorem , Root of complex number.	Quiz:1 Exam:1 Final Exam

	Detailed of Theoretical Contents		
Hours	**Contents**		**Assessment Tools**
	• Solution of a quadratic equation.		
	Textbook	1	Complex Numbers from A to ... Z, Titu Andreescu, Dorin Andrica Springer Science & Business Media, New York, second edition, 2014	
		2	Precalculus with Limits, Ron Larson, Cengage Learning, 3ed 2014	
16	**Linear Systems of equations :** • Elementary row operations. • Reduced row echelon form. • Solution of linear system by gauss- Jordan elimination.		Quiz:2 Exam:1 Final Exam
	Textbook	1	Precalculus with Limits, Ron Larson, Cengage Learning, 3ed 2014	
		2	Linear algebra, Sterling K. Berberian, Courier Corporation, Dover edition 2014	
16	**Vectors and the Geometry of space:** • Three-Dimensional Coordinate Systems. • Vectors. • The Dot Product. • The Cross Product. • Equations of Lines and Planes. • Cylinders and Quadric Surfaces.		Quiz:3 Exam:2 Final Exam
	Textbook	1	Linear algebra, Sterling K. Berberian, Courier Corporation, Dover edition 2014	
		2	C.Edward and D. penny, Elementary Linear Algebra	
14	**Introduction to differential equation:** • Solving first-order differential equations, Picard's Theorem. • Picard's Iteration Schema. • Solving linear homogeneous second order differential equations. • Solving linear nonhomogeneous second order differential equations. • Solving initial value problem by Laplace transforms.		Quiz:4 Exam:2 Final Exam
	Textbook	1	Elementary differential equation with Linear Algebra, Albert. Rabenstion	
		2	A Short Course in Ordinary Differential Equations, Qingkai Kong, Springer International publishing, 2014	
12	**Functions of Several Variables:** • Limits and Continuity • Partial Derivatives • Directional Derivatives and the Gradient Vector		Quiz:5 Final Exam
	Textbook	1	Functions of Several Real Variables, Martin A. Moskowitz, Fotios Paliogiannis, World Scientific. Publishing, 2014	

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	• Functions of Several Real Variables, Martin A. Moskowitz, Fotios Paliogiannis, World Scientific. Publishing, 2014