

Department	General Studies	Major							
Course Name	Mathematics	Course Code	MATH 101						
Prerequisites	---	Credit Hours CRH	3			CTH		4	
			L	3	P	0	T	1	
Course Description:									
The course includes the topics needed for the specialization such as: Sets, Number systems, Polynomials, Matrices and Determinants, linear and quadratic equations, system of linear equations and finally Area and Volumes computations.									
General Objective:									
This course provides an introduction of principle topics that enable the student to understand the specialized mathematics courses.									
Detailed Objectives:									
Trainee will be able to:									
1-	Be familiar with elementary nations of Sets and perform simple logical operations on them								
2-	Know the number systems and manipulate numbers.								
3-	Be familiar with algebra of Polynomials. Know how to factorize Polynomials ^[L] and simplify Algebraic fractions								
4-	Deal with Matrices and Determinants and know how to use them.								
5-	Solve first order equations, second order equations, and system of linear equations in two and three variables								
6-	Be familiar with how to calculate areas, perimeters and volumes of planar and solid geometrical shapes ^[L]								

Detailed of Theoretical Contents		
Hours	Contents	Assessment Tools
8	Sets: <ul style="list-style-type: none"> • Definition of a set and its characteristics . • Universal set, empty set. • Subsets of a set, equality of two sets. • Operations on sets (union, intersection, difference, symmetric difference). • Complement of a set and De Morgan's Theorem. • Numbers sets and their symbols. 	Oral questions Written questions Self-test Black-board
	Textbook	
	1	Classic Set Theory : For Guided Independent Study , D.C Goldrei, Taylor & Francis Group, 1 st Edition, 28 July 1996.
	2	Real Analysis : An Introduction to the Theory of Real Functions and Integration , Jewgeni H. Dshalalow, Taylor & Francis Group, 1 st Edition, 28 September 2000.

Detailed of Theoretical Contents			
Hours	Contents		Assessment Tools
6	Mathematical operations on number sets: <ul style="list-style-type: none"> Mathematical Operations on numbers sets (addition, subtraction, multiplication, division) Priority of mathematical operations in algebraic expressions Rational numbers and operations on them Decimal approximation of the real numbers 		Oral questions Written questions Self-test Black-board
	Textbook	1	Engineering Mathematics , KA. Stroud, Macmillan Press, seventh edition 2013
2		Real Analysis : An Introduction to the Theory of Real Functions and Integration , Jewgeni H. Dshalalow, Taylor & Francis Group, 1 st Edition, 28 September 2000	
14	Polynomials: <ul style="list-style-type: none"> Definition of polynomials (coefficients and degree). Operations on polynomials (addition, subtraction, multiplication, and long division). Factorization of quadratic polynomials $[x^2]$. Simplification of algebraic fractions. 		Oral questions Written questions Self-test Black-board
	Textbook	1	Advanced Calculus An introduction to Modern Analysis , Voxman. Boca Raton, Taylor & Francis Group, 1 st Edition, 19 October 2017, Chapter 1.
2		Basic Mathematics , H. Kruglak & J. T. Moore, SCHAUM Outlines, McGraw-Hill	
12	Matrices and Determinants: <ul style="list-style-type: none"> Concept of matrices and their types. Mathematical operations on matrices. Calculation of determinants (2x2 and 3x3). Calculation of inverse of matrices (2x2). 		Oral questions Written questions Self-test Black-board
	Textbook	1	Abstract Algebra An Inquiry Based Approach , Jonathan k. Hodge, Taylor & Francis Group, 1 st Edition, 21 December 2013
2		Engineering Mathematics , KA. Stroud, Macmillan Press, seventh Edition 2013	
16	Equations: <ul style="list-style-type: none"> Solving first order equations in one variable. Solving Quadratic Equations Using Discriminants. Solving system of linear equations using Substitution Method. Solving system of linear equations using Cramer Methods . 		Oral questions Written questions Self-test Black-board
	Textbook	1	Essential Mathematics for Engineers , W.J.R.H Pooler, 1 st Edition, 2011, Bookboon,
2		Difference Equations Theory , Application and Advanced Topics , 3 d Edition, Ronald E. Mickens, Taylor & Francis Group, 3 rd Edition, 6 March 2015	

Detailed of Theoretical Contents			
Hours	Contents		Assessment Tools
8	Area and Volumes: <ul style="list-style-type: none"> • Area and perimeter (square, triangle, circle, rectangle, trapezoidal) • Volumes (cubic, cylinder, cone, sphere) 		Oral questions Written questions Self-test Black-board
	Textbook	1	Essential Mathematics for Engineers , W.J.R.H Pooler, 1 st Edition, 2011, Bookboon,