

MAT8100 Essential Mathematics

Course Section Information – MAT8100 Section 010

Text: Basic Technical Mathematics with Calculus – SI Version, 9th Edition, Allyn Washington, Pearson

Topics		References	Hours
1.	 The Trigonometric Functions of Acute Angles Angles and their measure Defining the primary trigonometric functions for acute angles Defining the reciprocal trigonometric functions for acute angles 	Chapter 4 Sec. 4.1 Sec. 4.2	3
	 Values of the trigonometric functions (acute angles): sin, cos, tan Values of the trigonometric functions (acute angles): sec, csc, cot The right triangle 	Sec. 4.3 Sec. 4.4	
2.		Chapter 9	2
2.	 Trigonometric Functions of Any Angle Signs of the trigonometric functions Values of the primary trigonometric functions (any angle): sin, cos, tan Radians 	Chapter 8 Sec. 8.1 Sec. 8.2 Sec. 8.3	2
	QUIZ ONE (Chapters 4, 8): 23 Sep 09 – 5% of course mark Use of Pearson Education Formula Sheet Permitted.		
3.	 Vectors Vectors Components of vectors Vector addition by components given angle and direction of the vectors Applications of vectors 	Chapter 9 Sec. 9.1 Sec. 9.2 Sec. 9.3 Sec. 9.4	4
4.	 Graphs of the Trigonometric Functions Review of numerical fractions in simplest form, addition, subtraction, multiplication and division of numerical fractions (with particular emphasis on fractions involving π) Graph of the functions y = asinx and y = acosx Graph of the functions y = asinbx and y = acosbx Graph of the functions y = asin(bx + c) and y = acos(bx + c) 	Sec. 10.1 Sec. 10.2 Sec. 10.3	4

QUIZ TWO (Chapters 9, 10): 14 Oct 09 – 5% of course mark

Use of Pearson Education Formula Sheet Permitted.

Term Test One (Chapters 4, 8, 9, 10): 21 Oct 09 – 20% of course mark

Use of Pearson Education Formula Sheet Permitted.

5.	 The Straight Line The slope of a line Parallel lines Perpendicular lines Equation of a vertical line Equation of a horizontal line Equation of a line in slope-intercept form Equation of a line in slope-point form Equation of a line in the general form Sketching the graph of a line 	Chapter 21 Sec. 21.1 Sec. 21.2	2
6.	 Solving Systems of Linear Equations Linear equations, linear systems Graphical interpretation of the solutions of systems of two linear equations in two unknowns Solving systems of two linear equations in two unknowns algebraically using elimination by addition and subtraction Solving systems of three linear equations in three unknowns algebraically using elimination by addition and subtraction 	Chapter 5 Sec. 5.1 Sec. 5.3 Sec. 5.4 Sec. 5.6	2
7.	 Factoring and Fractions Special products: a(x + y) = ax + ay (x + y)(x - y) = x² - y² foil Common factors and difference of squares Factoring trinomials of the form: x² + bx +c ax² + bx +c Equivalent fractions Multiplication and division of fractions Addition and subtraction of fractions Equations involving fractions Equations involving fractions QUIZ THREE (Chapters 21, 5 and 6): 11 Nov 09 - 5% of course mark Use of Pearson Education Formula Sheet Permitted. Term Test Two (Chapters 4, 8, 9, 10, 21, 5, 6): 18 Nov 09 - 20% of course mark Use of Pearson Education Formula Sheet Permitted. 	Chapter 6 Sec. 6.1 Sec. 6.2 Sec. 6.3 Sec. 6.5 Sec. 6.6 Sec. 6.7 Sec. 6.8	5
8.	 Quadratic Equations The quadratic equation, the quadratic function Solving quadratic equations by factoring Solving quadratic equations using the quadratic formula Sketching the quadratic function 	Chapter 7 Sec. 7.1 Sec. 7.3 Sec. 7.4	2
9.	 Exponents and Radicals The laws of exponents for integral exponents (algebraic expressions) The laws of exponents for fractional exponents (algebraic expressions) Radicals in simplest form up to cubic roots Addition and subtraction of radicals (square roots) Multiplication of radicals (square roots) Division of radicals (square roots) 	Chapter 11 Sec. 11.1 Sec. 11.2 Sec. 11.3 Sec. 11.4 Sec. 11.5 Sec. 11.5	3

10.	The Exponential and Logarithmic Functions	Chapter 13	6
	Definition of the exponential and logarithmic functions	Sec. 13.1	
	Conversion between exponential and logarithmic forms	Sec. 13.2	
	Properties of logarithms	Sec. 13.3	
	Logarithm to the base 10	Sec. 13.4	
	Natural Logarithm	Sec. 13.5	
	Finding the logarithm to any base of a number using change of base		
	Solving exponential equations:Using same base	Sec. 13.6	
	Using logarithmsLogarithmic equations	Sec. 13.6	

QUIZ FOUR (Chapters 7, 11, and 13): 9 Dec 09 – 5% of course mark

Use of Pearson Education Formula Sheet Permitted.

11.	Complex Numbers	Chapter 12	5
	Basic definitions, complex numbers in rectangular form	Sec. 12.1	
	Basic operations with complex numbers in rectangular form	Sec. 12.2	
	Graphical representation of complex numbers	Sec. 12.3	
	Polar form of a complex number	Sec. 12.4	
	Exponential form of a complex number	Sec. 12.5	
	Products, quotients, powers, and roots of complex numbers in polar form	Sec. 12.6	

Teaching hours: 38

Evaluation

•	MyMathLab Quizzes	10%		-
•	4 In Class Quizzes (20 minutes maximum)	20%		2
•	2 Tests	40%		2
•	1 Final Exam (2 hour exam)	30%		3
			Evaluation hours:	7

Total hours: 45

MyMathLab Quizzes will be scheduled by the course professor – typically there is one quiz per week. Check MyMathLab for further information.

The Final Exam is a comprehensive assessment of your overall understanding of the course material. It is administered during Final Assessment Week 12 – 19 Dec 09.