



جامعة دبي
UNIVERSITY of DUBAI

General Education Department

Course Syllabus
Semester:

Course code & No.: GMAT 105

Course Title: Math for Science II

Prerequisites: Math for Science I

Faculty Member:

Contact Details: Email:

Phone:

Class Hours: Time:

Days:

Room:

Office Hours: Time:

Days:

Room:

Brief Course Description:

This course is intended for science majors. This course focuses on number theory, fundamentals of logic, Boolean algebra, counting techniques, infinite sequences and series, vectors and matrices, multivariable functions.

General Education Program Outcomes:

Apply basic analytical and IT skills.

Students will develop the following UD General Skills:

- 1) Critical thinking
- 2) Quantitative skills.

Course Learning Outcomes (CLO):

Students that successfully complete this course will be able to:

- (1) Understand and use binary and hexadecimal number system.
- (2) Construct a truth table for a given symbolic expression and use Boolean rules to simplify and to draw logic diagram.
- (3) Demonstrate an understanding of permutations and combinations through an ability to solve a variety of real world applications problems
- (4) Apply the concepts and notation for infinite sequences and series, and their convergence.
- (5) Differentiate and integrate vector-valued functions and find velocity and acceleration along a space curve

CLO's Mapping

CLO	General Skills	State below PO
Understand and use binary and hexadecimal number system.	1	Apply basic and analytic IT Skills.
Construct a truth table for a given symbolic expression and use Boolean rules to simplify and to draw logic diagram.	1, 2	Apply basic and analytic IT Skills.
Demonstrate an understanding of permutations and combinations through an ability to solve a variety of real world applications problems	1,2	Apply basic and analytic IT Skills.
Apply the concepts and notation for infinite sequences and series, and their convergence.	1,2	Apply basic and analytic IT Skills.
Differentiate and integrate vector-valued functions and find velocity and acceleration along a space curve	1,2	Apply basic and analytic IT Skills.

Assessment Scheme

CLO	Class Work (40%)			Mid-term Exam 25%	Final Exam 35%
	Individual Assignment 15%	Three Quizzes 15%	CAAP Test 10%		
#1	3 marks	3 marks	√	12 marks	4 marks
#2	3 marks	3 marks	√	13 marks	5 marks
#3	3 marks	3 marks	√		6 marks
#4	3 marks	3 marks	√		10 marks
#5	3 marks	3 marks	√		10marks
Total	15	15	10	25	35

Teaching Methods & Use of Modern Instructional Technology

This includes various forms of interactive lessons, activities, team problem solving sessions with the intention to meet various learning styles.

Weekly Schedule

Day/Week	Lecture	Chapter	Chapter Objectives	CLO	Assignment/Reading	Assessment
1	Number System	Handout	<ul style="list-style-type: none"> Convert from binary to decimal and from decimal to binary. Convert from hexadecimal to decimal and from decimal to hexadecimal 	1		
2	Number System	Handout	<ul style="list-style-type: none"> Convert from hexadecimal to binary and from binary to hexadecimal. Apply arithmetic operations to binary numbers. Determine the 1's and 2's complements of a binary number. 	1	Worksheet problems 1	
3	Fundamentals of Logic	Handout	<ul style="list-style-type: none"> Understand Foundations of Logic. Construct a truth table for a given symbolic for a given symbolic expression. Determine if two given statements are equivalent. Simplify logically expressions using the AND truth table. Simplify logically expressions using the OR truth table. 	2		
4	Fundamentals of Logic	Handout	<ul style="list-style-type: none"> Simplify logically expressions using the conditional truth table. Simplify logically expressions using the biconditional truth table 	2	Worksheet problems 2	Quiz 1
5	Boolean Algebra	Handout	<ul style="list-style-type: none"> Illustrate the basic of Boolean algebra. Evaluate and Simplify Boolean Functions using Boolean algebra. 	2		
6	Boolean Algebra	Handout	<ul style="list-style-type: none"> Valuate and Simplify Boolean Functions using Boolean algebra. Apply Laws Boolean algebra for manipulating logic expressions. 	2		
7	Boolean Algebra	Handout	<ul style="list-style-type: none"> Evaluate and Simplify Boolean Functions using Boolean algebra. Apply Laws Boolean algebra for manipulating logic expressions. Design single combinational circuits. 	2	Worksheet problems 3	Mid-Term
8	Basic Counting Principles	Handout	<ul style="list-style-type: none"> Provide an understanding of fundamental counting methods including permutations and combinations. Evaluate factorial expressions. Calculate a permutation. 	3		
9	Permutations and Combinations	Handout	<ul style="list-style-type: none"> Demonstrate an understanding of combinations and permutations. Apply basic counting principles to problems involving permutations and combinations. 	3	Worksheet problems 4	
10	Binomial	Handout	Provide an understanding of fundamental	3	Worksheet	Quiz 2

	Theorem		Binomial Theorem		problems 5	
11	Infinite Sequences	11	<ul style="list-style-type: none"> • To recognize and write arithmetic sequences. • To determine the convergence and divergence of the sequences. • To discuss sums that contain infinitely many terms. • To develop various tests that can be used to determine whether a given series converges or diverges. 	4	Exercise Page: 757	CAAP Mathematics Test
12	Infinite Series	11	<ul style="list-style-type: none"> • To discuss sums that contain infinitely many terms • To develop various tests that can be used to determine whether a given series converges or diverges. 	4	Exercise Page: 769 and page 786	
13	Vectors and Matrices	12	<ul style="list-style-type: none"> • To represent vectors as directed line segment. • To write the component forms of vectors. • To write vectors as linear combinations of • To find the dot product of two vectors. • To find the angle between two vectors and determine whether two vectors are orthogonal. • To find the direction angles of vectors. • To find particle's velocity vector, acceleration, speed, direction of motion from the position of a particle in space. 	5	Exercise Page: 860, page 870 and page 916	Quiz 3
14	Vectors and Matrices	12	To use matrices to solve systems of linear equations	5	Worksheet problems 6	
15	Multivariable Functions	14	<ul style="list-style-type: none"> • To define real-valued functions of two or more real variable. • To find partial derivatives of functions of two or more variables. • To use partial derivatives to solve real-life problems 	5	Exercise Page: 994	Final Exam Date on Class Schedule

Educational Resources

Educational Resource	Description	Comments
Textbooks Required	George B. Thomas, Jr., <i>Calculus</i> , Addison-Wesley Publishing Company, Inc., 11 th ed. 2005.	
Supporting readings:	(1) Rosen, Kenneth H., <i>Discrete Mathematics and Its Applications</i> , McGraw-Hill, Company, New York, 2006. (2) Smith, Robert T., and Minton, Robert B., <i>Calculus</i> , McGraw-Hill, Company, New York, 2007.	