Kingdom of Saudi Arabia
Ministry of Education
Jazan University
Faculty of Science
Mathematics Department

المملكة العربية السعودية
وزارة التعليم
جامعــة جـــازان
كلية العلوم
قسم الرياضيات

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Course Name	Discrete Mathematics	Course Code	Math-107		
Credit Hours	3	**Contact Hours**	**Theory**	**Lab**	**Total**
			3		3
Offered as	☐ **University Requirement** ☐ **College Requirement** ☒ **Program Requirement**		☒ **Required** ☐ **Elective**		
Offered in	☐ **BS - Computer Science** ☒ **BS – Information Technology**		☐ **BS - Computer & Network Engineering**		
Level	4th Level	**Prerequisite**	NIL		

Course Description:

This course provides an elementary introduction to mathematics logic, basic structures, basic and advanced counting, graphs, trees and Boolean algebra as follows:

- **Mathematical logic:** Definitions, examples, truth tables of compound propositions, propositional equivalence, logical equivalence and De Morgan's Law
- **Basic structures:** functions of integers numbers, some important functions, floor and ceiling functions and its properties
- **Basics of counting:** matching, counting principles, permutations, combinations, binomial theorem, Pascal's identity and triangle, generalized permutations and combinations
- **Advanced counting techniques:** iterative relations, recurrence relations, solving linear recurrence relation, generating functions, use of generating functions in counting
- **Graphs:** initial concepts in graphic theorem, corridors and cycles, definitions of graphs (directed and undirected) and examples, basic terminology, degree of a vertex, isolated and pendant, in-degree and out-degree, representing graphs, adjacency matrices, incidence matrices
- **Trees:** trees, trees generated, binary trees, investigation of tree in corridors problem, rooted tree
  Boolean Algebra: Boolean functions, logic gates.

Course Objectives:

After finishing the course, the student is expected to be familiar with the following:
- Identify functions of integer numbers and some relations on integer number.
- Identify permutations and combinations.
- Identify generating functions and their applications in counting.
- Identify graphics and corridors and their applications.
- Identify trees method and its uses in investigation.

Grading	⊠ Exam 1	20%	⊠ Exam 2	20%	⊠ Assignment(s)	10%
	⊠ Final	50%	⊠ Lab	0%	☐ Mini Project	0%

Text Book:
- Discrete mathematics and its applications, K.H. Rosen, McGraw-Hill, 6th edition(2007) .

Reference Book:

- Discrete and Combinatorial Mathematics: An applied introduction, R.P. Grimaldi, Addison Wesley, 5th edition (2004)
- Donald Knuth et. Al, Concrete Mathematics: A foundation for computer science, Addison Wesley, 2nd edition (1994)

- John Dossey et al, Discrete Mathematics and its applications, Addison Wesley 5th edition (2006)