

Course Description:

Course Name	Course Code	Contact Hours			year	level	Prerequisite
		Lectures	Sec/Lab	Credit hours			
Discrete Mathematics	107 Math	3	-	3	2	4	Non

Course summary:

General 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.

Course Description:

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 Assessments:

- First Exam 20%
- Second Exam 20%
- Quizzes and homework 10%
- Final Exam 50%

Methods of teaching the course:

- Academic lectures
- Scientific discussions
- Homework
- The use of mini-model of education
- Assign students to prepare scientific projects

The Textbook:

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

Scientific References:

- 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)

