ICS 253— Discrete Structures I

Term: 072 Section: 2

Time & Place: SMW 11 – 12, Bldg 24-244

INSTRUCTOR: Ebrahim Malalla
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COURSE SITE: http://www.ccse.kfupm.edu.sa/~malalla/ICS253/index.htm
OFFICE HOURS: SMW 9 – 11, and whenever you catch me.

DESCRIPTION

The course covers various topics in discrete mathematics that are widely used in Computer Science. Discrete mathematics deals with (finite or infinite) objects that are disconnected like books, tables, integers, graphs, and trees. The course is divided into three main areas: logic and mathematical reasoning, counting and combinatorial techniques, and graphs and trees.

PREREQUISITES

ICS 102

COURSE OBJECTIVES

1. To develop mathematical and thinking skills necessary for reading, comprehending, and constructing mathematical arguments.
2. To learn the fundamental concepts and techniques of discrete mathematics needed for problem solving in computer science.

COURSE LEARNING OUTCOMES

After completion of this course, the student should be able to:

1. formulate and derive propositional/predicate logic expressions, and apply proving methods.
2. apply counting techniques to solve combinatorial problems.
3. comprehend graphs and trees and their mathematical properties.

TEXTBOOK

The official textbook is

K. H. Rosen, *Discrete Mathematics and Its Applications*, 6th Ed., McGraw-Hill, 2006.

Students are also encouraged to refer to other books on discrete mathematics available in the library. Some of the highly recommended books are:

1. N.L. Biggs, *Discrete Mathematics* (revised edition), Clarendon Press, 1989.
2. Crisler, N., Fisher, P. and Froelich, *Discrete Mathematics through Applications*, 2nd Ed., W. H. Freeman Co., 2000.
3. A. Tucker, *Applied Combinatorics*, John Wiley, 1980.
4. R. P. Grimaldi, *Discrete and Combinatorial Mathematics: An Applied Introduction*, 4th Ed., Addison Wesley, 1998.
5. M. Huth, M. Ryan, *Logic in Computer Science*, Cambridge University Press, 2001.

EVALUATION

Assignments, quizzes & coursework	20%
Major Exam I Sat Mar. 22nd at 7:30-9:30 pm.	20%
Major Exam II Sun. May. 4th at 8-10 pm.	25%
Comprehensive Final Exam	35%

CONTENTS

The following schedule is tentative and subjected to changes. Any change will be announced in the class and course website/ WebCT.

Chapters	Topics	Excluded Sections
1	Logic and Proofs	
2	Sets, Functions, Sequences and Sums	
4	Induction and Recursion	4.2, 4.4, 4.5
5	Counting and Applications.	5.6
6	Discrete Probability	6.3, 6.4
7	Advance Counting Techniques	7.3—7.6
9	Graphs	9.6
10	Trees	10.5

REMINDERS

1. It is strongly recommended that class notes be taken on a regular basis.
2. The course website/WebCT is an important source of information. It will be updated regularly to contain up-to-date announcements, assignments and quizzes solutions, handouts, etc.
3. By the university rules, 9 absences yield a DN grade.
4. No assignments would be accepted without penalty after the due date.