King Fahd University of Petroleum & Minerals

College of Computer Sciences and Engineering
Information and Computer Science Department

ICS 253: Discrete Structures I (3-0-3)

Syllabus – Fall Semester 2009-2010 (091)

Website: Blackboard (WebCT) & http://www.ccse.kfupm.edu.sa/alvif/ICS253091/index.html

Class Time, Venue and Instructor Information:

Sec.	Time	Venue	Instructor	Office Hours
01	SMW 10:00-10:50am	24-146	**Mr. FAISAL ALVI** Office: 23-058 Phone: 03-860-1869 E-mail: alvif@kfupm.edu.sa http:faculty.kfupm.edu.sa/ics/alvif	SMW 02:00-03:00pm*
02	SMW 01:10-02:00pm	22-119	**Mr. FAISAL ALVI** Office: 23-058 Phone: 03-860-1869 E-mail: alvif@kfupm.edu.sa http:faculty.kfupm.edu.sa/ics/alvif	SMW 02:00-03:00pm*

Course Catalog Description

Propositional Logic, Propositional Equivalence, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs; Sets, Set Operations, Functions, Sequences and Summations; Mathematical Induction, Strong Induction, Recursive Definitions and Structural Induction; The Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations; Discrete Probability, Probability Theory; Recurrence Relations, Solving Linear Recurrence Relations, Generating Functions, Inclusion-Exclusion; Graphs and graph Models, Graph Terminology and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Planar Graphs, Graph Coloring; Introduction to Trees, Applications of Trees, Spanning Trees.

Co-requisites: ICS 102

Course Objectives

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

Course Learning Outcomes

Upon completion of the 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.

Required Material

- Rosen, Kenneth H. Discrete Mathematics and Its Applications, 6th Edition. New York, McGraw Hill, 2007.
- Lecture Handouts

Other Recommended References

- Discrete Mathematical Structures by Kolman, Busby and Ross, Pearson Education, 2008.
- Handbook of Discrete and Combinatorial Mathematics, by Kenneth Rosen, CRC Press, 2000.

Assessment Plan

Assessment Tool	**Weight**
Lecture quizzes (5 * 3%)	15%
Homework assignments	10 %
Programming Assignment (Experimentation in a Computation Algebra System)	5 %
Major Exam 1 (Date & Room: TBA)	20 %
Major Exam 2 (Date & Room: TBA)	20 %
Final Exam (comprehensive) [Date: as announced by the registrar]	30 %

Tentative Schedule

Week	Start Date	End Date	Book Sections	Activity (with dates)
1	3-Oct-09	7-Oct-09	1.1, 1.2	
2	10-Oct-09	14-Oct-09	1.2, 1.3	Quiz 01 (10-Oct-2009)
3	17-Oct-09	21-Oct-09	1.4, 1.5	HW 1 Assigned (17-Oct-2009)
4	24-Oct-09	28-Oct-09	1.6, 1.7	Quiz 02 (24-Oct-2009)
5	31-Oct-09	4-Nov-09	2.3, 2.4	HW 1 Due (31-Oct-2009)
6	7-Nov-09	11-Nov-09	4.1, 4.2	Major Exam 01 (7-Nov-2009)
7	14-Nov-09	18-Nov-09	5.1, 5.2	
#	21-Nov-09	25-Nov-09		Mid term Break
#	28-Nov-09	2-Dec-09		Mid term Break
8	5-Dec-09	9-Dec-09	5.3, 5.4	Quiz 03 (5-Dec-2009)
9	12-Dec-09	16-Dec-09	5.5, 6.1	HW 2 Assigned (12-Dec-2009)
10	19-Dec-09	23-Dec-09	6.2, 7.1	Quiz 04 (19-Dec-2009)
11	26-Dec-09	30-Dec-09	7.2, 9.1	HW 2 Due (26-Dec-2009)
12	2-Jan-10	6-Jan-10	9.2, 9.3	Major Exam 02 (2-Jan-2010)
13	9-Jan-10	13-Jan-10	9.4, 9.5	Programming Assignment (9-Jan-2010)
14	16-Jan-10	20-Jan-10	10.1, 10.2	Quiz 05 (16-Jan-2010)
15	23-Jan-10	27-Jan-10	Review	Programming Assignment Due (23-Jan-2010)
16	30-Jan-10	9-Feb-10		Final Exam (As scheduled by registrar)

Course Policies

- ***Course Website & Participation***: Students are required to periodically check the course website and download course material as needed. Several resources will be posted through the website as well. Keys to quizzes and exams are generally discussed during class as time permits but solutions will not be posted. WebCT will be used for communication and interaction, posting and submitting assignments, posting grades, posting sample exams, etc.
- ***Attendance***: Regular attendance is a university requirement; hence attendance will be checked at the beginning of each lecture and lab. Late arrivals will disrupt the class session. Hence, two late attendances (more than 10 minutes) will be considered as one absence. Missing more than 9 lectures or three or more unexcused labs will result in a DN grade without prior warning. To avoid being considered as absent, an official excuse must be shown no later than one week of returning to classes. Every unexcused absence leads to a loss of 0.5% of total grade.
- ***No makeup of homework, quizzes or exams will be given.***
- ***Re-grading policy***: If you have a complaint about any of your grades, discuss it with the instructor no later than a week of distributing the grades (except for the final). Only legitimate concerns on grading should be discussed.
- ***Office Hours***: Students are encouraged to use the office hours to clarify any part of the material that is not clear; however the instructor will only provide hints if it is an assigned task but not solve it.
- ***Academic honesty***: Students are expected to abide by all the university regulations on academic honesty. Cheating will be reported to the Department Chairman and will be severely penalized. Although collaboration and sharing knowledge is highly encouraged, copying others' work without proper citation, either in part or full, is considered plagiarism. Whenever in doubt, review the university guidelines or consult the instructor. Cheating in whatever form will result in F grade.
- ***Courtesy***: Students are expected to be courteous toward the instructor and their classmates throughout the duration of this course. Talking while someone else is speaking will not be tolerated. Furthermore, all cell phones must be turned off during class and exams. In addition, students are expected to be in class on time. More importantly, you are not allowed to leave the class unless it is an urgent matter. To contact your instructor, please use email through WebCT whenever possible and avoid using phone calls or written notes.

⊙⊙⊙ **Best of luck!!** ⊙⊙⊙