King Fahd University of Petroleum & Minerals
College of Computer Sciences and Engineering
Information and Computer Science Department

ICS 254: Discrete Structures II (3-0-3)

Syllabus – Spring Semester 2009-2010 (092)

Website: Blackboard (WebCT) & http://www.ccse.kfupm.edu.sa/~alvif/ICS254091/index.html

Class Time, Venue and Instructor Information:

Sec	Time	Venue	Instructor	Office Hours
01	SMW 11:00-11:50am	22-134	**Mr. FAISAL ALVI** Office: 23-058 Phone: 03-860-1869 E-mail: alvif@kfupm.edu.sa http:faculty.kfupm.edu.sa/ics/alvif	MW 0900-0955 am, T 2-3pm
02	SMW 08:00-08:50am	22-134	**Mr. FAISAL ALVI** Office: 23-058 Phone: 03-860-1869 E-mail: alvif@kfupm.edu.sa http:faculty.kfupm.edu.sa/ics/alvif	MW 0900-0955 am, T 2-3pm

Course Catalog Description
Number Theory: Modular Arithmetic, Integer Representation, Fermat's Little Theorem, Chinese Remainder Theorem, RSA., Applications from Number Theory; Recursive Definitions; Algorithm Correctness; Relations: Closures and Equivalence Relations, Partial Orderings and Lattices, Hasse Diagrams; Automata Theory: Finite State Machines, Regular Expressions, DFA, NFA and their equivalence, Grammars and Chomsky Hierarchy; Abstract Algebra: Groups, Homomorphisms and Lagrange's Theorem, Applications.

Pre-requisites: ICS 253

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. understand relations and their graphical representation.
2. explain basic concepts in number theory and apply them in problem-solving.
3. understand foundational knowledge of abstract algebra and automata theory.

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 %
Test 01: Number Theory (17th March 2010, 2-3pm or class time)	15 %
Test 02: Relations (14th April 2010, 2-3pm or class time)	15 %
Test 03: Automata Theory (19th May 2010, 2-3pm or class time)	15%
Final Exam (comprehensive) [Date: as announced by the registrar] [15% for the entire course and 15% for Group Theory]	30 %

Tentative Schedule

Week	Dates	Topics	HW (Monday)	Quizzes (Saturday)	Tests (Wednesday)
1	20 – 25 Feb	Number Theory			
2	27 Feb – 3 March	Number Theory	HW 1 Assigned	Quiz 01	
3	5 – 10 March	Number Theory			
4	12 – 17 March	Recursive Definitions	HW 1 Due		Test 01
5	19 – 24 March	Relations	HW 2 Assigned	Quiz 02	
6	26 – 31 March	Relations			
7	3 – 7 April	Relations	HW 2 Due		
8	10 – 14 April	Automata Theory		Quiz 03	Test 02
#	17 – 21 April	Midterm Break			
9	24 – 28 April	Automata Theory	HW 3 Assigned		
10	1 – 5 May	Automata Theory		Quiz 04	
11	8 – 12 May	Automata Theory	HW 3 Due		Test 03
12	15 – 19 May	Groups	HW 4 Assigned		
13	22 – 26 May	Groups		Quiz 05	
14	29 May – 2 June	Groups	HW 4 Due		
15	5 – 9 June	Review			Final Exam

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.

- ***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.

- ***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.

⊙⊙⊙ **Best of luck!!** ⊙⊙⊙