KS091201
MATEMATIKA DISKRIT
(DISCRETE
MATHEMATICS)

COURSE OVERVIEW

Discrete Math Team

Instructors

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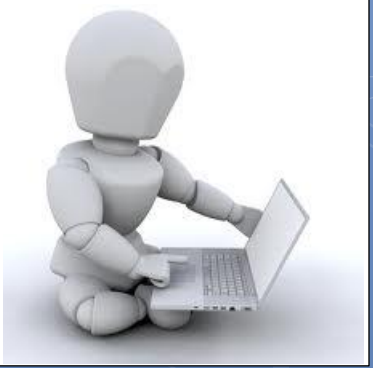
Outline

- Course Description
- Objectives
- Materials
- Textbooks
- Useful Links and Resources
- Lecture Regulations
- Discussions
- Make a Group

Course Description

- Mathematical foundations needed for further studies in computer related courses.
- The topics include logic, sets, functions, algorithms basics, counting, probability, and graph theory.
- This course covers **3** credits of your 144 credits studies workload.



Objectives

Students are able to use and apply mathematical logic for problem solving

Materials

- **The Foundations: *Logic and proof* :** Propotional logic. Propotional equivalences. Predicates and Quantifiers. Nested Quantifiers. Rules of inferences. Introduction to Proofs. Proof Methods and Strategy.
- **Basic structures:** Sets. Set operation. Functions. Sequences and Summations.
- **Fundamentals: *Algorithms, the Integers, and Matrices*:** Algorithm. the growth of function. Complexity of Algorithm. The Integers and Division. Primes and Greatest Common Divisors. Integers and Algorithm. Integers and Algorithms. Applications of Number Theory. Matrices.

Materials (cont.)

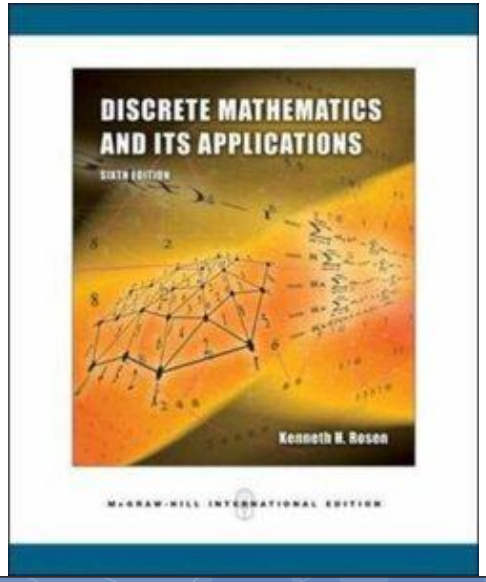
- **Induction and Recursion;** Mathematical Induction. Strong Induction and Well-Ordering. Recursive Definitions and Structural Induction. Recursive Algorithms. Program Correctness.
- **Counting;** The basics of Countings. The Pigeonhole Principle. Permutations and Combinations. Binomial Coefficients. Generalized Permutations and Combinations. Generating Permutations and Combinations.
- **Advanced Counting;** Recurrence relations. Solving linier Recurrence Relation. Divide and Conquer Algorithms and Recurrence Relations. Generating functions. Inclusion-exclusion. Application of Inclusion-Exclusion.

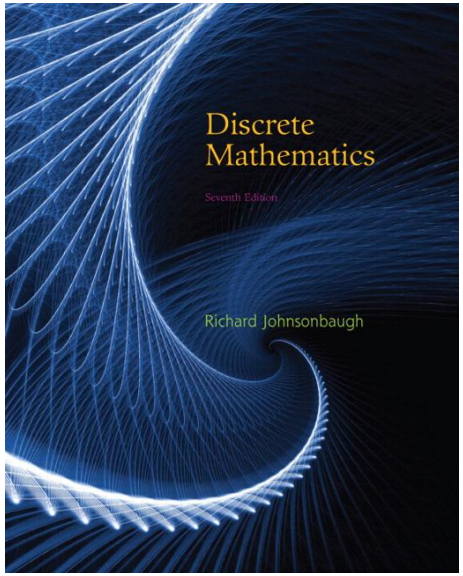
Materials (cont.)

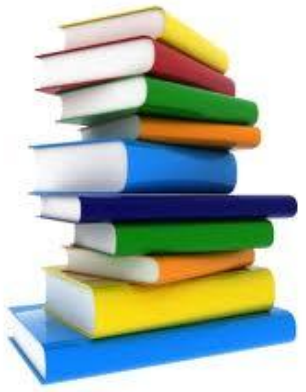
- **Relations :** Relations and their properties. *N*-ary relations and Their Applications. Representing Applications. Closures of Relations. Equivalences Relations. Partial ordering.
- **Graph:** Graph and Graph model. Graph terminology and special type of Graph.
- **Connectivity**. Euler and Hamilton Path. Shorthest-Path Problems. Planar Graph. Graph coloring.
- **Trees:** Introduction to Trees. Applications of Trees. Tree Traversal. Spanning Trees. Minimum Spanning Trees.

Textbooks

- **Kenneth H. Rosen**, *Discrete Mathematics and its Applications,* Sixth edition, Mc Graw-Hill International Edition. 2007.
- **Richard Johnsonbaugh,** *Discrete Mathematics,* Seventh edition, Pearson Education Inc., 2009







Useful Links and Resources

1. The Rosen companion website, http://www.mhhe.com/rosen
2. The Richard companion website, http://condor.depaul.edu/~rjohnson/dm7th/
3. The Mathematical Zone, http://www.mathzone.com

Lecture Regulations

Attendance

- Class attendance is required.
- You are responsible for all materials and assignments given in the class whether or not you are present. It is your responsibility to pick up any missed quizzes, assignments or handouts.
- Every class is important. If you miss a class you may still be tested on that material in the following week. For student whose attendance less than **80%**, his/her grade will be reset to zero (failed).
- Students who came **30 minutes** after the class started is not allowed to join the class

Lecture Regulations (cont.)

Assessment

- **Test**: Refreshment Quiz, Homework, Test (UTS, UAS)
- **Non Test**: Essay; Presentation and discussion; Paper; Class Participation

Lecture Regulations (cont.)

Academic Integrity

Academic integrity is expected. Academic dishonesty, including **plagiarism**, will result in a **0** for the related assignment or exam, and may result in dismissal from the course and an **E grade** for the course. Students must be familiar with the **Code of Academic Integrity** in the College catalog.

Lecture Regulations (cont.)

Late Homework/Make-up Policy

If you submit homework after the due date, **25%** of the total points will be deducted per late business day.

There will be no make-up quiz/exam unless you can prove that you were involved in an emergency.

More specifically:

1. If you were ill or had a family medical emergency, you should show me a doctor's diagnosis with the same date.
2. If you were involved in a traffic accident, you should show me the police report with the same date.
3. If any other reason prevented you from coming to the class, a third person who is not your friend must contact me independently to confirm it.

If you tell it to me before the class, it'll be much easier for you to have a make-up. The same rules apply to making up exams.

Discussion

Do you Think Math is useless for IS Dept. Students?

Watch this Video!

Make a Group

- Make a group consists of 3 students
- Take a seat close to your friends in the group.
- Write down : name, student id [NRP number] , phone number, and email of your friends including your self.
- Give a unique and "meaningful" name for your group. Name have to be closely related to **Discrete Math.**
- Submit your paper As Soon As Possible.

Assignment

Now, Discuss with your friends the application of **Discrete Math** in the real world.

Make a short report (1 to 2 pages A4 sized paper) and mail to me (tyas@its-sby.edu) before Wednesday (Sep 5, 2012) 09.00 am.