E0 221 DISCRETE STRUCTURES
(AUG-DEC 2011)

INSTRUCTOR: AMBEDKAR DUKKIPATI

Outline of the Course

Basic mathematical notions: Logic, sets, equivalence relations, functions, axiom of choice; *Abstract orders*: Quasi-orders, partial orders, Zorn's lemma, lattices, Boolian algebra, well orders, König's theorem; *Combinatorics*: Pigeonhole principle, The principle of inclusion and exclusion, recurrence relations; *Elementary number theory*: Peano axioms, mathematical induction, prime numbers, integers, fundamental theorem of arithmetic; *Groups*: Isomorphism theorems, Sylow theorems, Group actions, Polya's theory *Rings and Fields*: Ideals, polynomial rings, Chinese remainder theorem, finite fields; *Graph theory*: representation of graphs, Hamilton paths and cycles, trees.

References

Laszlo Lovasz, Jozsef Pelikan, Katalin L. Vesztergombi: Discrete Mathematics, Springer 2003.

Graham,R.L., Knuth, D.E. and Patashnik, O: Concrete Mathematics: A Foundation for Computer Science, Addison-Wesley Professional; 2 edition, 1994

I. N. Herstein: Topics in Algebra, 2 ed., Wiley India 1975.