

-- : Matrix Theory & Stochastic Programming\*

Prerequisite: fundamentals of linear algebra, matrices, probability concepts, linear programming.

Linear algebra: Vector spaces, linear maps, inner product spaces, norms, linear equations.

Matrices: Properties of matrices, eigenvalue problem, generalized inverse, Canonical forms.

General theory of linear programming: Theorems on the Simplex methods and linear inequalities, canonical representation of convex polyhedra.

Moment problems: General moment problems, Discrete moment problems, the structure of dual feasible bases, closed form bounds.

Bounding probabilities: Sharp bounds on the probability that at least  $r$  out of  $n$  events occur given the first few factorial moments, Hunter's upper bound, application to solution of satisfiability problem.

## References:

- David W. Lewis (2001, 3<sup>rd</sup> edition). *Matrix Theory*, World Scientific, Singapore.
- Andras Prekopa (1995). *Stochastic Programming*, Kluwer Academic, USA.

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\*Ph.D. Course work syllabus to be approved by the Senate.

Mrs. RB  
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Mrs. v.v.L  
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