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Video Lectures

Special software is required to use some of the files in this section: .mp3, .rm.

These files are also available from iTunes® and YouTube™.

LEC #	TOPICS	VIDEOS	AUDIO
1	Difference Methods for Ordinary Differential Equations	(RM - 56K) (RM - 220K)	(MP3 - 10.2MB)
2	Finite Differences, Accuracy, Stability, Convergence	(RM - 56K) (RM - 220K)	(MP3 - 12.8MB)
3	The One-way Wave Equation and CFL / von Neumann Stability	(RM - 56K) (RM - 220K)	(MP3 - 12.7MB)
4	Comparison of Methods for the Wave Equation	(RM - 56K) (RM - 220K)	(MP3 - 12MB)
5	Second-order Wave Equation (including leapfrog)	(RM - 56K) (RM - 220K)	(MP3 - 12.6MB)
6	Wave Profiles, Heat Equation / point source	(RM - 56K) (RM - 220K)	(MP3 - 12MB)
7	Finite Differences for the Heat Equation	(RM - 56K) (RM - 220K)	(MP3 - 12.6MB)
8	Convection-Diffusion / Conservation Laws	(RM - 56K) (RM - 220K)	(MP3 - 12.2)
9	Conservation Laws / Analysis / Shocks	(RM - 56K) (RM - 220K)	(MP3 - 10.2)
10	Shocks and Fans from Point Source	(RM - 56K) (RM - 220K)	(MP3 - 12.8MB)
11	Level Set Method	(RM - 56K) (RM - 220K)	(MP3 - 12.3MB)
12	Matrices in Difference Equations (1D, 2D, 3D)	(RM - 56K) (RM - 220K)	(MP3 - 12.4MB)
13	Elimination with Reordering: Sparse Matrices	(RM - 56K) (RM - 220K)	(MP3 - 12.8MB)
14	Financial Mathematics / Black-Scholes Equation	(RM - 56K) (RM - 220K)	(MP3 - 11.3MB)
15	Iterative Methods and Preconditioners	(RM - 56K) (RM - 220K)	(MP3 - 11.2MB)
16	General Methods for Sparse Systems	(RM - 56K) (RM - 220K)	(MP3 - 10.8MB)
17	Multigrid Methods	(RM - 56K) (RM - 220K)	(MP3 - 11.7MB)
18	Krylov Methods / Multigrid Continued	(RM - 56K) (RM - 220K)	(MP3 - 11.3MB)
19	Conjugate Gradient Method	(RM - 56K) (RM - 220K)	(MP3 - 12MB)
20	Fast Poisson Solver	(RM - 56K) (RM - 220K)	(MP3 - 11.1MB)
21	Optimization with constraints	(RM - 56K) (RM - 220K)	(MP3 - 11.7MB)
22	Weighted Least Squares	(RM - 56K) (RM - 220K)	(MP3 - 12MB)
23	Calculus of Variations / Weak Form	(RM - 56K) (RM - 220K)	(MP3 - 11.8MB)
24	Error Estimates / Projections	(RM - 56K) (RM - 220K)	(MP3 - 11.5MB)
25	Saddle Points / Inf-sup condition	(RM - 56K) (RM - 220K)	(MP3 - 11.8MB)

LEC #	TOPICS	VIDEOS	AUDIO
26	Two Squares / Equality Constraint $Bu = d$	(RM - 56K) (RM - 220K)	(MP3 - 12MB)
27	Regularization by Penalty Term	(RM - 56K) (RM - 220K)	(MP3 - 11.3MB)
28	Linear Programming and Duality	(RM - 56K) (RM - 220K)	(MP3 - 12.9MB)
29	Duality Puzzle / Inverse Problem / Integral Equations	(RM - 56K) (RM - 220K)	(MP3 - 11.8MB)