TENTATIVE

Derivative Securities
G63.2791, Fall 2003
Mondays 7:10–9:00pm
1302 WWH


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Content: An introduction to arbitrage-based pricing of derivative securities. Topics include: arbitrage; risk-neutral valuation; the log-normal hypothesis; binomial trees; the Black-Scholes formula and applications; the Black-Scholes partial differential equation; American options; one-factor interest rate models; swaps, caps, floors, swaptions, and other interest-based derivatives.

Lecture notes: Lecture notes, homework assignments, etc. will be posted on my web page in postscript and pdf format – normally within a day of when they are distributed.

Prerequisites: Calculus, linear algebra, and discrete probability. Concerning probability: students should be familiar with concepts such as expected value, variance, independence, conditional probability, the distribution of a random variable, the Gaussian distribution, the law of large numbers, and the central limit theorem. These topics are addressed early in most undergraduate texts on probability.

Course requirements: There will be approx 7 homework sets, one every couple of weeks. Collaboration on homework is encouraged (homeworks are not exams) but registered students must write up and turn in their solutions individually. There will be an in-class final exam.

Books: We will not follow any single book linearly. However to master the material of this course you should expect to do plenty of reading. References are

• R. Jarrow and S. Turnbull, *Derivative securities*, Southwestern Publishing.

All the books listed above are on reserve in the CIMS library.