LTCC intensive course May 22-23 2008, Ragnar Norberg, LSE:

MATHEMATICS FOR INSURANCE AND FINANCE

Prerequisites in probability and stochastic processes theory: Marked point processes and their associated martingales; Levy processes; Martingale techniques. Life insurance mathematics: Markov and semi-Markov models for individual life histories; Notions of reserves; Management of risk in life and pension insurance. Non-life insurance mathematics: The risk process of claims less premiums; The probability of ruin; Reserves in general insurance. Basic financial mathematics: Pricing by the principle of no arbitrage; Hedging in incomplete markets. Market valuation and the use of financial instruments in insurance: Catastrophe bonds, longevity bonds, mortality bonds and other insurance derivatives; Mortality swaps.

Literature: Self-contained lecture notes will be prepared for the course.

For further and complementary reading are recommended:
Andersen, Borgan, Gill, and Keiding (1993). *Statistical Models Based on Counting Processes*. Springer-Verlag.
Cont and Tankov (2004): *Financial Modelling With Jump processes.* Chapman & Hall
Moeller and Steffensen (2007): *Market-valuation Methods in Life and Pension Insurance*. Cambridge University Press.
Asmussen (2000): *Ruin Probabilities*. World Scientific.