

## Models in Financial Mathematics

Topics for the test (29.10. and 12.11. 2008)

- **Finite Probability Space**

- calculations with indicator functions (product, sum)
- how to compute the expectation
- independence
- properties of the conditional expectation (tower property, function independent/measurable)
- martingales

- **Finance**

- mathematical definitions of the financial concepts:  
strategy, self-financing strategy, admissible strategy, arbitrage opportunity  
EMM, contingent claim, attainable option, viable market, complete market
- 2 trading dates (0 and  $T$ )-models (with interest):  
compute the hedging strategy, the EMM and the fair price of an European option  $H$ .
- the CRR model (with  $T$  trading dates and interest):  
draw the "tree" for  $(S_t)$  with the probabilities of  $(S_T)$ ,  
compute (or know) the EMM, compute the fair price / a pricing formula of an European option like in the course using the formula  
"fair price" =  $\mathbb{E}_{\mathbf{Q}} \frac{H}{S_T^0}$ .
- be able to formulate the 'Fundamental Theorem of Asset Pricing' and the theorem about a complete viable market (section 3.7)