

# Non-Life Insurance Mathematics

topics for the tests (12.12.07 and 16.01.08)

**Claim number process  $N(t)$**

- Poisson process: definition, properties
- Renewal process: definition, properties

**the Cramér Lundberg model**

properties of the total claim amount process  
(expectation and variance)

**the Renewal model**

**premium calculation principles**

what is different between the classical and modern principles?

**compound Poisson variable**

**reinsurance treaties**

what are they for?

**ruin probability  $\psi(u)$**

premium income  $p(t) = ct$ ,

risk process  $U(t) = u + p(t) - S(t)$

with total claim amount process  $S(t) = \sum_{i=1}^{N(t)} X_i$ ,

and initial capital  $u$ ,

ruin =  $\{\omega : U(t, \omega) < 0 \text{ for some } t > 0\}$ , ruin time  $T = \inf\{t > 0 : U(t, \omega) < 0\}$ ,

ruin probability  $\psi(u) = \mathbb{P}(\text{ruin}) = \mathbb{P}(T < \infty)$ .