Mathematics Department
Brooklyn College, City University of New York
Math 3801 (Introduction to Life Contingencies) Syllabus
4 hours, 4 credits

Background
Random variable, discrete and continuous probability distributions, moments, moment generating functions, calculus, basic ordinary differential equation

Survival Models
Future life time random variable and its moments, force of mortality, curtate future life time random variable, actuarial notation for survival and mortality probability

Life tables and Selection
Standard life tables, life table functions, fractional age assumptions(uniform distribution of death(UDD), constant force of mortality(CFM)), select and ultimate survival models, select life tables

Insurance benefits
Whole life insurance valuation(continuous and discrete case), term life insurance, pure endowment, endowment insurance, deferred insurance benefits, recursion, insurance benefit payable m thly, UDD assumption in for insurance at fractional ages, variable insurance benefits

Life annuities
Annual life annuities, annuities payable continuously and m thly, deferred annuities, increasing annuities,

Premium calculation
Present value of future loss random variable, equivalence principle, net premium, gross premium, portfolio percentile premium, extra risks

Policy values
Policy value with annual cash flows, recursive formula, annual profit, asset shares, policy value with m thly and continuous cash flows, Thiele differential equation and its numerical solution, policy alteration, retrospective policy value