LIFE INSURANCE

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Aims

This course is designed to provide students with an introduction to the actuarial valuation of life insurance products. Starting from basic biometric issues (life tables and their use in actuarial calculations), the course focuses on premiums, policy reserves and related assessments for life insurance products (term insurance, endowment insurance, life annuities, etc.). The technical structure of participating and unit-linked products is described.

Topics

1. The basic actuarial valuation of life-contingent benefits.
   a. Types of life-contingent benefits.
   b. Life tables (structure, survival and death probabilities, population and market tables, risk factors in mortality, mortality dynamics).
   c. Actuarial values for fixed benefits.
   d. The mutuality process in life insurance.
2. Pricing life insurance products
   a. Single premium.
   b. Annual level and single recurrent premiums.
   c. Natural premiums.
   d. Loadings.
3. The policy reserve (technical provisions).
   a. The policy reserve according to a traditional approach.
   b. Time profile of the reserve for the mail life insurance products.
   c. The portfolio reserve according to different regulations: introductory ideas.
   d. Balance equations and related assessments (risk and saving components, expected profit).
4. Financial linking.
   a. Participating benefits: Annual and partial lock-in.
   b. Unit-linked benefits: Benefits structure (without and with guarantees).
   c. Hybrid products.

References

Olivieri A. and Pitacco E. (2015). *Introduction to Insurance Mathematics. Technical and Financial Features of Risk Transfers*, 2nd Edition, EAA Series, Springer