



CAPACITY BUILDING TRAINING PROGRAM ON

“Fundamentals of Actuarial Methods & Applications for Technical Staff of Insurance & Social Protection Institutions”

Date: 14th - 17th September 2020

Venue: PSSSF Plaza - Arusha, Tanzania

Training Fees: USD 1,000 per Participant

1. OBJECTIVE OF THE COURSE:

The ultimate aim of this course is to equip participants with basic understanding of actuarial concepts and techniques for valuation practices in the context of insurance and social protection. To this end, participants will be able to understand the **basic methods** applied in the actuarial valuation of insurance and social security schemes as well as describe the contents of the actuarial valuation report appropriately. While a detailed study of the full process of actuarial valuation of, say, an occupational pension scheme or a life insurance scheme is beyond the scope of this course, an important objective is that participants should gain an understanding of a foundation of mathematical theory on which the work of actuaries is based.

2. STRUCTURE OF THE COURSE

Part I of the course introduces actuarial mathematics and related topics. The aim is to provide participants with the capacity to make a range of basic calculations, but, perhaps more importantly, to appreciate the foundations and principles on which the more complex calculations for a full-scale actuarial valuation are carried out. Thus we shall study (i) *the mathematics of finance*, and (ii) *basic demographic analysis*.

Part II introduces the actuarial practice. It starts with a general background to the work of the actuary. Then, the course presents a step-by-step account of the process by which the actuarial valuation is usually carried out; concrete examples are presented to illustrate the progress of the work. Finally, we discuss the content of the actuarial report with examples from different reports as practical demonstrations of various aspects of actuarial work.

3. TARGET AUDIENCE

The Basic Actuarial Course is relevant for technical staff of the following organizations;

- Private & Public Insurance Schemes,
- Social Security Schemes,
- Commercial Banks & Related Financial Organizations,
- Private/Occupational Pension Funds,

4. LEARNING OUTCOMES

At the end of the course, participants are expected to be able to;

1. *Compute and interpret the mathematical concepts of time value of money and Life tables in insurance.*
2. *Explain the work of an Actuary as well as the scope and context of actuarial work in insurance/social security.*
3. *Explain the fundamentals, methodologies and principles of actuarial valuation.*
4. *Interpret actuarial reports.*

5. COURSE CONTENT/TOPICS

1.0 The context of actuarial work

- 1.1 Who is an Actuary?
- 1.2 The role of an Actuary in insurance/social security
- 1.3 Actuarial work in African context
- 1.4 International Actuarial Guidelines

2.0 Financial Mathematics

- 2.1 Simple & Compound Interest
- 2.2 PV & FV of an amount
- 2.3 Annuities & Life Annuities

3.0 Analysis of Life Tables

- 3.1 History
- 3.2 Types of Lifetables
- 3.3 Constructing a Life Table
- 3.4 Calculating Life Expectancy
- 3.5 Calculating mortality & survival probabilities

4.0 The Actuarial Valuation Process

- 4.1 Why Actuarial Valuations are Needed
- 4.2 Step-by-Step Procedure How to Conduct Actuarial Valuation
- 4.3 The Actuarial Model
- 4.4 Data and Information base for Modelling
- 4.5 Actuarial Valuation Results and
- 4.6 Sensitivity Testing
- 4.7 Calculating Benchmark Indicators

5.0 The Actuarial Report

- 5.1 Standard Structure of the Actuarial Report
- 5.2 Interpreting the Actuarial Report
- 5.3 Communicating the Results

6. METHODS OF DELIVERY

- Problem Based Learning (PBL) – i.e. Case Study Analysis
- Presentations & Discussions
- Lectures

7. ASSESSMENT METHODS

- Attendance
- Participation
- Written Assignments

8. RECOMMENDED READINGS

1. Bowers, N. L., Gerber, H. U., Hickman, J. C., Jones, D. A., Nesbitt, C. J. (1997). **Actuarial Mathematics**. 2nd Edition. Society of Actuaries.
2. Wai-Sum Chan, Yiu-Kuen Tse, (2017). **Financial Mathematics for Actuaries**. 2nd Edition. WSPC.
3. Pierre Plamondon, Anne D. Michael Cichon, (1999). **Actuarial Practices in Social Security**. ILO/ISSA, Geneva.
5. Iyer, S. (1999). **Actuarial Mathematics of Social Security Pensions**. Quantitative Methods in Social Protection Financing Series (Geneva, ILO/ISSA), sections 5.3 to 5.7.
5. Dickson, D. M., Hardy, M. R., and Waters, H. R. (2009). **Actuarial Mathematics for Life Contingent Risks**, Cambridge University Press.

Key words: *Actuary, Actuarial Science, Insurance, Social Protection, Pensions.*

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