COURSE NAME AND CODE: MATHEMATICS OF PENSION FUNDS

COURSE CODE: MATH 3805

LEVEL: III

SEMESTER: II

NUMBER OF CREDITS: 3

PREREQUISITES:

Mathematics of Finance (MATH2210), Introduction to Actuarial Mathematics (MATH2220), Actuarial Mathematics II (MATH3704)

RATIONALE

The goal of the syllabus is to provide an understanding of the fundamental concepts of Pension Funds, the legal framework in which they operate, how they are administered and the basic methods and mathematics used in determining their financial condition (Actuarial Valuation) at any point in time. This is, by far, one of the largest areas of actuarial practice and provides good employment opportunities for graduates.

COURSE DESCRIPTION

This course is directly related to the Society of Actuaries course 5 and one of the specialist final subjects in any of the Actuarial Fellowship Examinations.

LEARNING OUTCOMES

At the end of this course, students should be able to:

- Describe sources of retirement income.
- Describe all types of Pension Funds
- Describe the legal framework in which Pension Funds operate
- Identify the reasons a government would support Pension Funds in the Private Sector
- Identify the reasons a company would implement a Pension Fund for its employees
- Describe all the legal documents supporting a Pension Fund
- Describe the records which must be kept for a Pension Fund.
- Describe the role and responsibilities of the Board of Trustees
- Describe all types of benefits that may be included in a Pension Fund
- Design a simple Pension Plan
- Describe the different types of Actuarial Valuations
- Understand the different types of Actuarial Valuation Methods.
- Understand the procedures and concepts used in choosing an Actuarial Valuation basis.

- Carry out the calculations for valuing the benefits in an Actuarial Valuation.

CONTENT

General Points about a Pension Plan
Definition of Pension, Possible sources of Pension, Need for a Pension, Approved Pension Plan, Non Approved Pension Plan, Government's Role, Taxation/Contributions, Investment Income, Types of Pension Plans, Trust Deed and Roles, Administration Contract, Investment Contract, Investment Policy, Risks affecting Pension Benefits, Role of employer, Design Issues, Usual Benefits, Retirement Ages, Options at Retirement, Replacement Ratio, Quality of a Pension Regulatory Agencies

Actuarial Basis for Actuarial Valuation
Purpose of Valuation, Demographic Basis, Financial/Economic Basis

Cost Methods (I)
Individual Cost Methods

Topic 4: Cost Methods (II)
Aggregate Cost Methods

TEACHING METHODOLOGY:

The course will be delivered by a combination of theoretical classes, practices (tutorials) and other group activities. The delivery mode will be largely interactive. The total estimated 39 contact hours are broken down as follows 26 hours of lectures and 12 hours of tutorials. The course material (complimentary notes, practice problems and assignments) will be posted on ourvle *http://ourvle.mona.uwi.edu/*

ASSESSMENT:

The course assessment will be divided into two components: a coursework component worth 25% and a final exam worth 75%.

- One coursework examination (1 hour) worth 15% of the final grade
- Two written assignments each worth 5% of the final grade
- The final examination will be two hours in length and consist of compulsory questions.

REFERENCE MATERIALS:

Prescribed Text:

Bowers, N.L. et al, *Actuarial Mathematics* (Second Edition), 1997, Society of Actuaries, ISBN-10: 0938959468

Highly Recommended Text:
McGill, D.M., *Fundamentals of Private Pensions* (Ninth Edition), 2010, Oxford Press ISBN-10: 0199544514

Online resources:
The following are free online lectures which the student may access for revision purposes:
http://www.moj.gov.jm/laws/statutes/Pensions%20Act.pdf
www.sias.org.uk/data/papers/**valuations**.pdf/DownloadPDF