

ACTUARIAL MATHEMATICS (ACT)

ACT 2020 Economic and Financial Applications 3 cr

A synthesis of macroeconomic issues, quantitative aspects of finance using interest theory, and insurance economics.

ACT 2120 Interest Theory 3 cr

The application of calculus to discrete and continuous interest functions. Key topics are the measurement of interest, present and accumulated values, and annuities. May not be held with the former ACT 3320.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: MATH 1232 or the former MATH 1690 or MATH 1700 (B) or MATH 1710 (B).

Equiv To: ACT 3320

ACT 2210 Introduction to Risk Management 3 cr

Mathematical tools for the quantitative assessment of risk and their application to problems encountered in risk management.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite or co-requisite: STAT 2400 (D) or consent of instructor.

ACT 2321 Mathématiques financières 3 cr

Étude de l'intérêt composé et des rentes discrètes et continues; équations de valeur, analyse de fonds; détermination de taux de rendement; construction de tables. On ne peut se faire créditer ACT 2321 et ACT 2320 et ACT 3320.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Préalable: MATH 1500 ou MATH 1501 ou MATH 1520, ou l'équivalent.

ACT 3130 Actuarial Models 1 3 cr

Elementary concepts respecting the quantification of the financial impact of contingent payments. May not be held with ACT 3630.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisites: ACT 2120 (C+) and [STAT 2800 (D) or the former STAT 3400 (D) or the former STAT 3500 (D)].

Mutually Exclusive: ACT 3630

ACT 3230 Actuarial Models 2 3 cr

Intermediate and advanced concepts respecting the quantification of the financial impact of contingent payment. May not be held with ACT 3630.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: ACT 3340 (C+).

Mutually Exclusive: ACT 3630

ACT 3340 Valuations for Actuarial Practice 3 cr

Introduction of valuation practices in actuarial science, including rational valuation of derivative securities, valuation for a life insurance policy, and ratemaking and reserving for property and casualty insurance.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: ACT 3130 (C+) or consent of instructor.

ACT 4000 Advanced Actuarial Topics 3 cr

A selection of advanced topics of current actuarial interest.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: ACT 3230 (D).

ACT 4010 Regression Modeling in Actuarial Science 3 cr

Construction of generalized linear models and regression-based time series models with actuarial applications. May not be held with IDM 4050 when titled "Time Series and Regression Analysis for Management".

PR/CR: A minimum grade of C is required unless otherwise indicated.

Pre- or co-requisite: STAT 3100 (D) or the former STAT 3600 (D) or the former STAT 3800 (D).

Mutually Exclusive: IDM 4050

ACT 4020 Short Term Actuarial Mathematics I 3 cr

Introduction to useful frequency and severity models, aggregate models, risk measures and construction and selection of parametric and non-parametric models. May not be held with the former ACT 4140 or the former ACT 4630.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Pre- or co-requisite: STAT 3100 (D) or the former STAT 3600 (D) or the former STAT 3800 (D).

Mutually Exclusive: ACT 4140, ACT 4630

ACT 4030 Short Term Actuarial Mathematics II 3 cr

Introduction to useful credibility theory, insurance and reinsurance coverage, and pricing and reserving for short term insurance coverages. This course covers part of the learning objectives of Short-Term Actuarial Mathematics Exam by the Society of Actuaries (SoA). May not be held with the former ACT 4240 or the former ACT 4630.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: ACT 4020 (C+) (or the former ACT 4140(C+)).

Equiv To: ACT 4240

Mutually Exclusive: ACT 4630

ACT 4040 Time Series and Statistical Learning in Actuarial Science 3 cr

A variety of topics are introduced, including regression-based time series models, basic ideas of statistical learning (supervised versus unsupervised, regression versus classification, model accuracy assessment), and some key concepts, models and methods of principle components analysis, decision trees as well as cluster analysis. All models and methods are illustrated with extensive examples from business and management. May not be held with IDM 4050 when titled "Time Series and Regression Analysis for Management".

PR/CR: A minimum grade of C is required unless otherwise indicated.

Pre- or corequisite: ACT 4010 (C+).

Mutually Exclusive: IDM 4050

ACT 4060 Actuarial Aspects of Investment Practice 3 cr

This course examines stochastic interest rates and tools and techniques for coping with general product issues in asset/liability management.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisites: FIN 2010 (C+), FIN 2200 (C+), or FIN 2201 (C+).

ACT 4160 Introduction to Property and Casualty Insurance Industry 3 cr

This course introduces a variety of topics on basic techniques for ratemaking in property and casualty insurance practice, including ethics, exposure, classification, credibility, implementation, loss adjustment, premium, etc.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Pre- or corequisite: ACT 2120 (C+) or consent of instructor.

ACT 7050 Readings in Quantitative Methods 3 cr

Supervised readings in one of the areas of quantitative methods.

ACT 7300 Seminars in Actuarial Science 3 cr

The course consists of several topic presentations on current trends and issues in actuarial practice. Such issues may include but are not limited to: pension; universal life; critical illness; group benefits; individual retirement savings; capital guarantees under variable products; Canadian life & health insurers; micro-insurance; agricultural insurance; reinsurance; property insurance; catastrophe risk; and code of professional conduct.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: ACT 3230 or consent of instructor.

ACT 7400 Longevity Risk Modeling and Management 3 cr

This course introduces recent developments on longevity risk modelling and management. The students will be exposed to various research topics on longevity risk, mortality models for both single population and multiple populations, pricing longevity securities, measuring basis risk, and selecting hedging strategy.

ACT 7540 Advanced Topics in Actuarial Mathematics 3 cr

A variety of mathematical methods and statistical models from quantitative risk management, including financial time series, multivariate models, aggregate risk, credit risk and operational risk.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisites: STAT 3600 or equivalent, or consent of instructor.

ACT 7600 Applied Statistical Methods in Actuarial Science 3 cr

This course introduces applied statistical methods in actuarial science. The students will learn various research topics on regression and time series modeling in actuarial practices.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: written consent of instructor.