

B.Sc. in Financial Mathematics and Economics

What does an actuary work at?

An actuary is a mathematician whose work is mainly concerned with insurance and finance, predicting the longer-term financial consequences of current and past decisions, taking due account of various risk factors. An actuary designs solutions to problems that involve financial risk or future uncertainty, primarily in connection with pensions, insurance (general, life, health etc.) and investment.

How long will people live and for how much should their lives be insured? Which pension product should you recommend to a 30 year old factory worker and which pension product would be best for a 50-year-old self-employed person who has made no pension provision to date? What will money do when it is invested in pensions, insurance, stock markets or other financial services? These are the types of questions that an actuary addresses on a day-to-day basis.

An actuary spends time working on a computer, developing a complex spreadsheet with facts, assumptions and predictions and then meeting with other people to discuss the assumptions and their appropriateness. Often, an actuary needs to explain the proposal to someone else that needs to understand the main idea without all of the details. A significant amount of time is spent in discussion with colleagues and in finding the best approach to a new problem. Therefore, good communication skills are a necessity for an actuary!

The applications of Actuarial Science are quite diverse, ranging from the:

- assessment of life risks using data on mortality, sickness and accidents, together with interest rate estimation
- costing of insurance premiums
- formulation of investment strategies
- design and cost of pension plans
- many other new areas of actuarial science

The focus is very much on risk and uncertainty. Consequently, mathematical models for uncertainty, as provided by the theory and methods of probability and statistics, are fundamental to the work of the actuary.

How can I qualify as an actuary?

Graduates of the B.Sc. in FME can choose to secure a position as a trainee actuary and finish the professional examinations while working or can complete a Masters or Higher Diploma programme in Actuarial Science, before starting as a trainee actuary. These postgraduate programmes are available, for example, at Heriot-Watt University, Edinburgh or UCD and graduates can obtain additional exemptions from the first level of professional examinations before completing the final levels of the professional examinations while in employment.

To become a qualified actuary, you must satisfy the professional education and work-experience requirements of the Faculty of Actuaries (FFA) and Institute of Actuaries (FIA),

based in the United Kingdom. The Society of Actuaries in Ireland has full responsibility for the professional conduct of actuaries in Ireland but is not an examining body.

Information on qualifying as an actuary is available here: www.actuaries.org.uk

The actuarial examinations consist of four stages: the Core Technical stage, the Core Application stage, the Specialist Technical stage and Specialist Application.

What exemptions do graduates from the B.Sc. in FME get?

There are nine subjects in the Core Technical stage. The Core Technical stage focuses on the areas of Financial and Actuarial Mathematics, Probability/Statistics and Economics/Finance.

The B.Sc. in FME at NUI Galway provides a good foundation in all of these areas. At present, NUI Galway has agreed three examination exemptions with the Institute of Actuaries at the Core Technical stage, namely: CT1 Financial Mathematics, CT3 Probability and Mathematical Statistical and CT7 Economics.

We are also currently working towards securing a number of further exemptions that will apply to all future students on the programme.

If you undertake a Masters or Higher Diploma in Actuarial Science, you may receive further exemptions from the CT level of actuarial examinations.

You should also note that actuarial studies contains a number of courses in Economics and the B.Sc. in FME at NUI Galway is the only Irish undergraduate programme in Financial Mathematics that includes Economics as a major element.

We certainly believe that our students leave the programme well prepared for pursuing an actuarial career.

“After completing the B.Sc. in FME at NUI Galway, I was accepted on the Higher Diploma in Actuarial Science, at Heriot-Watt University, in Edinburgh. The courses I had already studied provided a solid foundation for my postgraduate studies. In Heriot-Watt, students from this undergraduate programme at NUIG have a reputation every year for doing very well in the H.Dip. in Actuarial Science.”

Alan Smith, trainee actuary, Royal Sun Alliance B.Sc. in Financial Mathematics and Economics, NUI Galway, 2005 H.Dip. in Actuarial Science, Heriot-Watt University, 2006

What is the difference between Financial Mathematics and Actuarial Mathematics?

Financial Mathematics is not the same as Actuarial Mathematics but includes certain aspects of actuarial science. For examples, the BSc. in Financial Mathematics & Economics has courses in probability / statistics, economics / finance, models / life contingencies and mathematics of finance that would be considered part of both Financial Mathematics and Actuarial Mathematics.

However, Financial Mathematics in this programme also contains, for example, courses on neural networks (this is essentially computer learning programmes used for prediction and estimation), algorithms, and language and operating systems which are not part of Actuarial Mathematics.

Financial Mathematics is a broader area of study and prepares persons for employment at the technical level of finance, computing and many of the new areas that require highly numerate graduates.